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8 NLOS
5082 NLO
(NLO OR NLOS)
163729 NONLINEAR
2 NONLINEARS
163731 NONLINEAR
(NONLINEAR OR NONLINEARS)
755839 NON
34 NONS
755866 NON
(NON OR NONS)
556631 LINEAR
55 LINEARS
556655 LINEAR
(LINEAR OR LINEARS)
20423 NON(3A)LINEAR
19775 HYPERPOLARIZ?
L1 197907 (NLO OR NONLINEAR OR (NON(3A)LINEAR) OR HYPERPOLARIZ?)

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484684 CHARGE
62432 CHARGES
519427 CHARGE
(CHARGE OR CHARGES)
188697 HOLE
110661 HOLES
253252 HOLE
(HOLE OR HOLES)
752033 TRANSPORT?
925147 GENERAT?

38473 (CHARGE OR HOLE) (3A) (TRANSPORT? OR GENERAT?)

15956 CARBAZOLE

2128 CARBAZOLES

16513 CARBAZOLE

(CARBAZOLE OR CARBAZOLES)

5767 VINYLCARBAZOLE

122 VINYLCARBAZOLES

5783 VINYLCARBAZOLE

(VINYLCARBAZOLE OR VINYLCARBAZOLES)

2223 POLYVINYLCARBAZOLE

34 POLYVINYLCARBAZOLES

2250 POLYVINYLCARBAZOLE

(POLYVINYLCARBAZOLE OR POLYVINYLCARBAZOLES)

L2 57950 ((CHARGE OR HOLE) (3A) (TRANSPORT? OR GENERAT?)) OR CARBAZOLE OR
VINYLCARBAZOLE OR POLYVINYLCARBAZOLE)

=> s 11 and 12

L3 1293 L1 AND L2

=> s (photochrom? or diarylethane or diheteroarylethane or spiropyran or fulgide or leuco or photo

12436 PHOTOCHEM?

178 DIARYLETHANE

234 DIARYLETHANES

340 DIARYLETHANE

(DIARYLETHANE OR DIARYLETHANES)

0 DIHETEROARYLETHANE

1635 SPIROPYRAN

993 SPIROPYRANS

1990 SPIROPYRAN

(SPIROPYRAN OR SPIROPYRANS)

480 FULGIDE

317 FULGIDES

568 FULGIDE

(FULGIDE OR FULGIDES)

11290 LEUCO

7 LEUCOS

11295 LEUCO

(LEUCO OR LEUCOS)

10084 PHOTOISOMER?

345680 ISOMER?

L4 369617 (PHOTOCHEM? OR DIARYLETHANE OR DIHETEROARYLETHANE OR SPIROPYRAN
OR FULGIDE OR LEUCO OR PHOTOISOMER? OR ISOMER?)

=> s 13 and 14

L5 27 L3 AND L4

=> d all 1-3

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AN 2005:1086283 CAPLUS

DN 143:325922

ED Entered STN: 11 Oct 2005

TI Dependence of the Two-Photon Absorption Cross Section on the Conjugation
of the Phenylacetylene Linker in Dipolar Donor-Bridge-Acceptor
Chromophores

AU Lee, Soohyun; Thomas, K. R. Justin; Thayumanavan, S.; Bardeen, Christopher
J.

CS Departments of Chemistry, University of California, Riverside, CA, 92521,
USA

SO Journal of Physical Chemistry A (2005), 109(43), 9767-9774

CODEN: JPCAFH; ISSN: 1089-5639

PB American Chemical Society

DT Journal

LA English

CC 22-9 (Physical Organic Chemistry)

Section cross-reference(s): 73

AB The ***nonlinear*** optical properties of four ***isomeric***
dipolar two-photon chromophores are compared. The chromophores consist of
a ***carbazole*** electron donor coupled to a naphthalimide electron
acceptor by a phenylacetylene bridge. By variation of the connectivity of
the bridge at the Ph groups, four compds. with 0, 1, and 2 meta linkages
are synthesized. The linear and ***nonlinear*** optical properties of

these compds. are measured. Despite similar linear absorption cross sections, the two-photon absorption cross section Δ of the all-meta compd. is almost a factor of 10 lower than the all-para compd. By taking the detailed mol. conformations into account in order to calc. accurate dipole moment changes, we find that the decrease in Δ results largely from the decreased charge transfer ability with increasing no. of meta linkages. We find that a two-state model can be used to predict semiquant. the obsd. trend in Δ on the basis of the linear optical properties of the mols. This work illustrates the dramatic effect the ground-state polarizability can have on the ***nonlinear*** optical response of org. compds. and also provides a way to quantify the ability of meta linkages to inhibit charge transfer in their ground-state configuration.

- ST two photon absorption conjugation phenylacetylene linker dipolar chromophore
- IT UV absorption
(UV-visible; dependence of two-photon absorption cross section on conjugation of phenylacetylene linker in dipolar donor-bridge-acceptor chromophores)
- IT Aromatic hydrocarbons, properties
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(aryl alkynes, dipolar chromophores with phenylacetylene linker; dependence of two-photon absorption cross section on conjugation of phenylacetylene linker in dipolar donor-bridge-acceptor chromophores)
- IT Alkynes
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(aryl, dipolar chromophores with phenylacetylene linker; dependence of two-photon absorption cross section on conjugation of phenylacetylene linker in dipolar donor-bridge-acceptor chromophores)
- IT Fluorescence quenching
(by intramol. electron transfer in polar solvents; dependence of two-photon absorption cross section on conjugation of phenylacetylene linker in dipolar donor-bridge-acceptor chromophores)
- IT Chromophores
Fluorescence
Molar absorptivity
Nonlinear optical materials
Solvent polarity effect
(dependence of two-photon absorption cross section on conjugation of phenylacetylene linker in dipolar donor-bridge-acceptor chromophores)
- IT Dipole moment
(difference between ground and excited states; dependence of two-photon absorption cross section on conjugation of phenylacetylene linker in dipolar donor-bridge-acceptor chromophores)
- IT Electron transfer
(intramol.; dependence of two-photon absorption cross section on conjugation of phenylacetylene linker in dipolar donor-bridge-acceptor chromophores)
- IT Two-photon absorption
(***nonlinear*** ; dependence of two-photon absorption cross section on conjugation of phenylacetylene linker in dipolar donor-bridge-acceptor chromophores)
- IT Molecular structure-property relationship
(optical; dependence of two-photon absorption cross section on conjugation of phenylacetylene linker in dipolar donor-bridge-acceptor chromophores)
- IT Molecules
(size; dependence of two-photon absorption cross section on conjugation of phenylacetylene linker in dipolar donor-bridge-acceptor chromophores)
- IT ***Nonlinear*** optical absorption
(two-photon; dependence of two-photon absorption cross section on conjugation of phenylacetylene linker in dipolar donor-bridge-acceptor chromophores)
- IT Conjugation (bond)
(π -; dependence of two-photon absorption cross section on conjugation of phenylacetylene linker in dipolar donor-bridge-acceptor chromophores)
- IT 865443-57-8 865443-61-4, 3-Bromo-9-propyl-9H- ***carbazole***
RL: RCT (Reactant); RACT (Reactant or reagent)
(coupling with (trimethylsilyl)acetylene; dependence of two-photon absorption cross section on conjugation of phenylacetylene linker in

dipolar donor-bridge-acceptor chromophores)

IT 865443-53-4P 865443-54-5P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(coupling with (trimethylsilyl)acetylene; dependence of two-photon absorption cross section on conjugation of phenylacetylene linker in dipolar donor-bridge-acceptor chromophores)

IT 589-87-7, 1-Bromo-4-iodobenzene 591-18-4, 1-Bromo-3-iodobenzene

RL: RCT (Reactant); RACT (Reactant or reagent)
(coupling with alkyne; dependence of two-photon absorption cross section on conjugation of phenylacetylene linker in dipolar donor-bridge-acceptor chromophores)

IT 865443-59-0P 865443-60-3P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(coupling with alkyne; dependence of two-photon absorption cross section on conjugation of phenylacetylene linker in dipolar donor-bridge-acceptor chromophores)

IT 1066-54-2, (Trimethylsilyl)acetylene

RL: RCT (Reactant); RACT (Reactant or reagent)

(coupling with arylbromide; dependence of two-photon absorption cross section on conjugation of phenylacetylene linker in dipolar donor-bridge-acceptor chromophores)

IT 865443-55-6P 865443-56-7P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(coupling with arylbromide; dependence of two-photon absorption cross section on conjugation of phenylacetylene linker in dipolar donor-bridge-acceptor chromophores)

IT 865443-52-3P 865443-58-9P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(coupling with aryl iodide; dependence of two-photon absorption cross section on conjugation of phenylacetylene linker in dipolar donor-bridge-acceptor chromophores)

IT 865443-48-7P 865443-49-8P 865443-50-1P 865443-51-2P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(dependence of two-photon absorption cross section on conjugation of phenylacetylene linker in dipolar donor-bridge-acceptor chromophores)

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L5 ANSWER 2 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

AN 2005:951479 CAPLUS

ED Entered STN: 31 Aug 2005

TI Light-induced phenomena in polymeric thin films

AU Nespurek, S.; Pospisil, J.

CS Institute of Macromolecular Chemistry, Academy of Sciences of the Czech Republic, Prague, 162 06, Czech Rep.

SO Journal of Optoelectronics and Advanced Materials (2005), 7(3), 1157-1168
CODEN: JOAMF2; ISSN: 1454-4164

PB National Institute for Optoelectronics

DT Journal

LA English

CC 74 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

AB Photoprocesses in polymers are generally divided into two groups: (i) Photochem. processes resulting in a permanent chem. alternation of a macromol., like bond scission, crosslinking and oxidn., (ii) Phys. (reversible) processes involving the distribution, relocation and ultimate fate of the excess energy assocd. with an excited mol., following absorption of a photon, like photoluminescence, phosphorescence, photoinduced electron transfer and formation of charge-transfer states (excitons). The excitation is very often accompanied by charge redistribution and change of mol. conformation. An extreme case is the ***photochromic*** effect - photoreversible reaction of two forms of a single mol. The changes in the mol. conformations lead very often to the formation of metastable electronic states. Similarly to semiconductors, electron-hole pairs or ion-pairs can be generated by the action of light in conjugated polymers. Their dissociation leads to the ***generation*** of free ***charge*** carriers. Photoconductive polymers with optical ***non*** - ***linear*** activity can be used for photorefractive and holog. memories.

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L5 ANSWER 3 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

AN 2004:296729 CAPLUS

DN 142:45454

ED Entered STN: 12 Apr 2004

TI Photorefractive gratings in DRY-doped hybrid sol-gel films

AU Raschella, R.; Marino, I.-G.; Lottici, P. P.; Bersani, D.; Lorenzi, A.; Montenero, A.

CS Istituto Nazionale per la Fisica della Materia (INFM) and Dipartimento di Fisica, Raman-Exafs Laboratory, Universita di Parma, Parma, 43100, Italy

SO Optical Materials (Amsterdam, Netherlands) (2004), 25(4), 419-423

CODEN: OMATET; ISSN: 0925-3467

PB Elsevier Science B.V.

DT Journal

LA English

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

AB Photorefractive gratings were obtained with 632.8 nm writing beams in org.-inorg. SiO₂-based films. The hybrid glass was prep'd. by a sol-gel technique, starting from org. Si precursors, and contains Disperse Red 1 (DR1), ***carbazole*** units and 2,4,7-trinitro-9-fluorenone (TNF). The photorefractive gain, which was found unexpectedly even without poling field, was detd. through an asym. energy exchange by two-beam coupling measurements. The effects of the polarization of the writing beams and of a circularly polarized ***photoisomerizing*** radiation during the erasure of the grating were interpreted in terms of an orientational contribution to the grating formation.

ST photorefractive grating DR1 doped hybrid sol gel film

IT ***Nonlinear*** optical properties

(beam coupling; photorefractive gratings in DRY-doped hybrid sol-gel films)

IT Photorefractive effect

(gain; photorefractive gratings in DRY-doped hybrid sol-gel films)

IT Energy transfer

Optical gain

Photorefractive gratings

Sol-gel processing

(photorefractive gratings in DRY-doped hybrid sol-gel films)

IT 2872-52-8, Disperse Red 1

RL: OCU (Occurrence, unclassified); PRP (Properties); OCCU (Occurrence) (photorefractive gratings in DRY-doped hybrid sol-gel films)

IT 78-10-4, TEOS 919-30-2, 3-Aminopropyltriethoxysilane 24801-88-5, 3-(Triethoxysilyl)propyl-isocyanate 73500-82-0, ***Carbazole*** -9carbonyl chloride

RL: RCT (Reactant); RACT (Reactant or reagent)

(photorefractive gratings in DRY-doped hybrid sol-gel films)

RE.CNT 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD

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 its structure diagram
 FHITSEQ ----- First HIT RN, its text modification, its CA index name, its
 structure diagram, plus NTE and SEQ fields
 KWIC ----- Hit term plus 20 words on either side
 OCC ----- Number of occurrence of hit term and field in which it occurs

To display a particular field or fields, enter the display field codes. For a list of the display field codes, enter HELP DFIELDS at an arrow prompt (>). Examples of formats include: TI; TI,AU; BIB,ST; TI,IND; TI,SO. You may specify the format fields in any order and the information will be displayed in the same order as the format specification.

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ABS ----- GI and AB
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CAN ----- List of CA abstract numbers without answer numbers
CBIB ----- AN, plus Compressed Bibliographic Data
DALL ----- ALL, delimited (end of each field identified)
DMAX ----- MAX, delimited for post-processing
FAM ----- AN, PI and PRAI in table, plus Patent Family data
FBIB ----- AN, BIB, plus Patent FAM
IND ----- Indexing data
IPC ----- International Patent Classifications
MAX ----- ALL, plus Patent FAM, RE
PATS ----- PI, SO
SAM ----- CC, SX, TI, ST, IT
SCAN ----- CC, SX, TI, ST, IT (random display, no answer numbers;
SCAN must be entered on the same line as the DISPLAY,
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IALL ----- ALL, indented with text labels
IBIB ----- BIB, indented with text labels
IMAX ----- MAX, indented with text labels
ISTD ----- STD, indented with text labels

OBIB ----- AN, plus Bibliographic Data (original)
OIBIB ----- OBIB, indented with text labels

SBIB ----- BIB, no citations
SIBIB ----- IBIB, no citations

HIT ----- Fields containing hit terms
HITIND ----- IC, ICA, ICI, NCL, CC and index field (ST and IT)
containing hit terms
HITRN ----- HIT RN and its text modification
HITSTR ----- HIT RN, its text modification, its CA index name, and
its structure diagram
HITSEQ ----- HIT RN, its text modification, its CA index name, its
structure diagram, plus NTE and SEQ fields
FHITSTR ----- First HIT RN, its text modification, its CA index name, and
its structure diagram
FHITSEQ ----- First HIT RN, its text modification, its CA index name, its
structure diagram, plus NTE and SEQ fields
KWIC ----- Hit term plus 20 words on either side
OCC ----- Number of occurrence of hit term and field in which it occurs

To display a particular field or fields, enter the display field codes. For a list of the display field codes, enter HELP DFIELDS at an arrow prompt (=>). Examples of formats include: TI; TI,AU; BIB,ST; TI,IND; TI,SO. You may specify the format fields in any order and the information will be displayed in the same order as the format specification.

All of the formats (except for SAM, SCAN, HIT, HITIND, HITRN, HITSTR, FHITSTR, HITSEQ, FHITSEQ, KWIC, and OCC) may be used with DISPLAY ACC to view a specified Accession Number.

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LS ANSWER 4 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN
AB Org.-inorg. films based on SiO₂, contg. Disperse Red 1 (DR1),
carbazole units and 2,4,7-trinitro-9-fluorenone (TNF), have been
prep'd. by a sol-gel technique. Diffraction gratings have been produced
through different effects: photoinduced. . . coupling (2BC)

measurements. The effect of the polarization of the writing beams on the grating and of a circularly polarized ***photoisomerizing*** radiation during grating erasure has been interpreted in terms of an orientation contribution to the grating formation.

- IT ***Isomerization***
 (cis-trans, photochem.; recording of holog. gratings in hybrid org.-inorg. films based on SiO₂ sol-gel films contg. Disperse Red 1 and ***carbazole*** units and trinitrofluorenone)
- IT Birefringence
 (photoinduced; recording of holog. gratings in hybrid org.-inorg. films based on SiO₂ sol-gel films contg. Disperse Red 1 and ***carbazole*** units and trinitrofluorenone)
- IT Holographic diffraction gratings
Holographic recording materials
Hybrid organic-inorganic materials
Molecular orientation
Photorefractive effect
Sol-gel processing
 (recording of holog. gratings in hybrid org.-inorg. films based on SiO₂ sol-gel films contg. Disperse Red 1 and ***carbazole*** units and trinitrofluorenone)
- IT ***Nonlinear*** optical properties
 (two-beam-coupling; recording of holog. gratings in hybrid org.-inorg. films based on SiO₂ sol-gel films contg. Disperse Red 1 and ***carbazole*** units and trinitrofluorenone)
- IT 7647-01-0, Hydrochloric acid, uses
RL: CAT (Catalyst use); USES (Uses)
 (recording of holog. gratings in hybrid org.-inorg. films based on SiO₂ sol-gel films contg. Disperse Red 1 and ***carbazole*** units and trinitrofluorenone)
- IT 685091-04-7
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
 (recording of holog. gratings in hybrid org.-inorg. films based on SiO₂ sol-gel films contg. Disperse Red 1 and ***carbazole*** units and trinitrofluorenone)
- IT 919-30-2, 3-Aminopropyltriethoxysilane 2872-52-8, Disperse Red 1
24801-88-5, 3-(Triethoxysilyl)propylisocyanate 73500-82-0,
Carbazole -9-carbonyl chloride
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
 (recording of holog. gratings in hybrid org.-inorg. films based on SiO₂ sol-gel films contg. Disperse Red 1 and ***carbazole*** units and trinitrofluorenone)
- IT 129-79-3, 2,4,7-Trinitro-9-fluorenone
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
 (sensitizer; recording of holog. gratings in hybrid org.-inorg. films based on SiO₂ sol-gel films contg. Disperse Red 1 and ***carbazole*** units and trinitrofluorenone)

L5 ANSWER 5 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

AB . . . realized in the case where a doping of polymers by low-mol.-wt. dyed impurities does not essentially distort spectral, luminescent and ***nonlinear*** optical properties of the individual components of polymer compn. The influence of polymer nature and chem. constitution of org. dyes. . . was considered. The main paths of energy degrdn. of electronic excitation in such materials - internal conversion, electron transfer and ***photoisomerization*** - were analyzed. The role of dyes in the process of generation, in recombination and in the carriage of charges.

IT 25067-59-8, ***Polyvinylcarbazole*** 55774-96-4,

Poly-N-epoxypropylcarbazole

RL: DEV (Device component use); PRP (Properties); USES (Uses)

(mol. engineering of dye-doped polymers for optoelectronics)

L5 ANSWER 6 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

AB CdSe/CdS core/shell, tri-n-octylphosphine oxide passivated, quantum dots are used to sensitize a photorefractive polymer composite. The composite also consists of poly(N- ***vinylcarbazole***) as the nominally ***charge*** ***transporting*** matrix and an electrooptic chromophore. The efficacy of sensitization and consequent photorefractive

performance is investigated using transmission spectroscopy and ellipsometry.. . .

IT ***Isomerization***

(cis-trans, photochem.; photorefractive poly(***vinylcarbazole***)-based composite contg. (ethylhexyloxydimethylnitrophenylazo)benzene sensitized by octylphosphine oxide passivated CdSe/CdS quantum dots in relation to)

IT Degenerate four wave mixing

Ellipsometry

Holographic diffraction gratings

Nanoparticles

Photorefractive effect

Photorefractive materials

Quantum dot devices

Refractive index

Space charge

(photorefractive poly(***vinylcarbazole***)-based composite contg. (ethylhexyloxydimethylnitrophenylazo)benzene sensitized by octylphosphine oxide passivated CdSe/CdS quantum dots)

IT Holographic recording materials

(photorefractive poly(***vinylcarbazole***)-based composite contg. (ethylhexyloxydimethylnitrophenylazo)benzene sensitized by octylphosphine oxide passivated CdSe/CdS quantum dots in relation to)

IT Birefringence

(transient; photorefractive poly(***vinylcarbazole***)-based composite contg. (ethylhexyloxydimethylnitrophenylazo)benzene sensitized by octylphosphine oxide passivated CdSe/CdS quantum dots)

IT ***Nonlinear*** optical properties

(two-beam-coupling; photorefractive poly(***vinylcarbazole***)-based composite contg. (ethylhexyloxydimethylnitrophenylazo)benzene sensitized by octylphosphine oxide passivated CdSe/CdS quantum dots)

IT 78-50-2, Tri-n-octylphosphine oxide 1306-23-6, Cadmium sulfide, properties 1306-24-7, Cadmium selenide, properties 25067-59-8, Poly(N- ***vinylcarbazole***) 176681-76-8, EHDNPB

RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)

(photorefractive poly(***vinylcarbazole***)-based composite contg. (ethylhexyloxydimethylnitrophenylazo)benzene sensitized by octylphosphine oxide passivated CdSe/CdS quantum dots)

L5 ANSWER 7 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

AB The mechanism of optical nonlinearity of new polymer composites based on a conducting polymer [poly(9- ***vinylcarbazole***)] and fullerenes C70 and C60 was studied both exptl. and theor. The ***nonlinear*** -optical studies of self-action and coupling of two 633-nm beams from a He-Ne laser were performed, and variations in the absorption. . . in polarizabilities of fullerene mols. and their anion radicals, which are formed upon absorption of photons and charge transfer by poly(9- ***vinylcarbazole***) mols.

ST fullerene polyvinyl ***carbazole*** ***nonlinear*** optical property nanocomposite

IT Conducting polymers

Nanocomposites

Nonlinear optical susceptibility

Photochromism

Photorefractive effect

(optical nonlinearity of fullerene-doped polymer nanocomposites)

IT 25067-59-8, Poly(9- ***vinylcarbazole***) 99685-96-8, Fullerene (C60) 115383-22-7, Fullerene C70

RL: PRP (Properties)

(optical nonlinearity of fullerene-doped polymer nanocomposites)

L5 ANSWER 8 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

TI Synthesis, properties and ***photochromism*** of novel charge transfer compounds with Keggin anions and protonated 2,2'-biquinoline

AB Several novel compds. with protonated 2,2'-biquinoline (biqui) and Keggin polyoxoanions (.alpha.- ***isomers***), (Hbiqui)_m[XM₁₂O₄₀].cntdot.n(sol v), X = P (m = 3), Si (m = 4); M = Mo, W; n = 0, 3; solv. . . highly disordered 2,2'-biquinoline mols. and .alpha.-[SiW₁₂O₄₀]₄- anions.

Photosensitivity to sunlight and to W-lamp visible light was assessed for all compds. ***Photochromic*** properties were found for solids with [XM₁₂O₄₀]_m- Keggin anions. Redn. of these anions upon irradn. was obsd.

by diffuse reflectance. . . sunlight, the extent of anion redn. followed the order (Hbiqui)3[PMo12O40].cntdot.3DMF>(Hbiqui)4[SiMo12O40].cn tdot.3DMF>(Hbiqui)3[PMo12O40]>(Hbiqui)4[SiMo12O40].cntdot.4H2O. The Kurtz powder test was used to evaluate the 2nd-order ***nonlinear*** optical properties of the prep'd. compds. (Hbiqui)4[SiW12O40].cntdot.3H2O originated a 2nd harmonic generation signal with intensity apprx.15% that of urea for.

ST Keggin biquinolinium charge transfer prep'n UV; ***nonlinear*** optical property tungstosilicate biquinolinium charge transfer;
photochromism molybdophosphate molybdsilicate biquinolinium charge transfer; biquinolinium molybdophosphate molybdsilicate tungstophosphate tungstosilicate charge transfer prep'n UV

IT Heteropoly acids

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation) (Keggin; prepn., properties and ***photochromism*** of charge transfer compds. with Keggin anions and 2,2'-biquinolinium)

IT ***Photochromism***

(in molybdsilicate and molybdophosphate biquinolinium charge transfer complexes)

IT Second-harmonic ***generation***

(of tungstosilicate biquinolinium ***charge*** transfer complex)

IT Charge transfer complexes

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation) (prepн., properties and ***photochromism*** of charge transfer compds. with Keggin anions and 2,2'-biquinolinium)

IT 503014-07-1P 503014-09-3P 503014-15-1P 503014-17-3P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation) (prepн., UV-visible spectra and ***photochromism***)

L5 ANSWER 9 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

AB The origin of the optical nonlinearity of an org. polymeric compn. including fullerene C70 and poly(9- ***vinylcarbazole***) (PVK) was investigated by two-beam coupling and self-action of a cw laser beam at 633 nm, and spectroscopically. The local.

ST ***photochromism*** optical nonlinearity ***polyvinylcarbazole*** fullerene

IT ***Nonlinear*** optical properties
Photochromism

Polarizability

(optical nonlinearity of C70-sensitized photorefractive compns. caused by prodn. of anion-radicals)

IT 25067-59-8, Poly(9- ***vinylcarbazole***) 115383-22-7, C70 Fullerene

RL: PRP (Properties)
(optical nonlinearity of C70-sensitized photorefractive compns. caused by prodn. of anion-radicals)

L5 ANSWER 10 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

TI Multi-grating in photorefractive composites containing ***nonlinear*** chromophore azo-dye 1-n-butoxyl-2,5-dimethyl-4-(4'-nitrophenylazo)benzene

AB Distinct electroabsorption grating and ***photoisomerization*** grating as well as photorefractive grating were obsd. in the composite consisting of 1-n-butoxyl-2,5- dimethyl-4-(4'-nitrophenylazo)benzene (BDMNPAB): poly(N- ***vinylcarbazole***) (PVK): 2,4,7-trinitro-9-fluorenone (TNF) in a wt. ratio of 44:55:1. Based on the quick translation technique of two-beam coupling exptl. geometry, the authors measured the electroabsorption grating to be 6-7 cm⁻¹, and

photoisomeric effect also brought an absorption grating of 2-3 cm⁻¹. ***Photoisomeric*** effect caused index grating was sep'd. from the others by analyzing the dynamic behavior of the gratings, and an amplitude.

ST multi grating photorefractive composite ***nonlinear*** chromophore azo dye; photorefractive grating ***photoisomerization*** electroabsorption two beam coupling

IT ***Nonlinear*** optical properties

(beam coupling; multi-grating in photorefractive composites contg.

nonlinear chromophore azo-dye 1-n-butoxyl-2,5-dimethyl-4-(4'-nitrophenylazo)benzene)

IT Azo dyes

Electric field effects

Electrooptical absorption

Photorefractive gratings

(multi-grating in photorefractive composites contg. ***nonlinear***

IT chromophore azo-dye 1-n-butoxyl-2,5-dimethyl-4-(4'-nitrophenylazo)benzene)

IT ***Isomerization***

. (***photoisomerization*** ; multi-grating in photorefractive composites contg. ***nonlinear*** chromophore azo-dye 1-n-butoxyl-2,5-dimethyl-4-(4'-nitrophenylazo)benzene)

IT 129-79-3, 2,4,7-Trinitro-9-fluorenone 25067-59-8, Poly(N- ***vinylcarbazole***) 210281-60-0

RL: DEV (Device component use); PRP (Properties); USES (Uses)
(multi-grating in photorefractive composites contg. ***nonlinear*** chromophore azo-dye 1-n-butoxyl-2,5-dimethyl-4-(4'-nitrophenylazo)benzene)

L5 ANSWER 11 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

TI ***Photoisomeric*** -chromophore-doped polymers for directional spatial filtering by optical threshold processing

AB We demonstrate spatial filtering by using the azo-chromophore-based ***nonlinear*** optical effect of self-beam polarization modulation and optical threshold processing. The real-time image-processing scheme is described by use of an . . . system, Fourier-transform operation, and an azo-chromophore-doped film as a spatial filter. As Disperse Red 1 dye (DR1) doped in an N-poly(***vinylcarbazole***) (PVK) film with N-ethylcarbazole (ECZ) of low glass-transition temp. exhibits self-polarization rotation after thin-film transmission, a linearly polarized probe beam. . . of an original input image can be manipulated as they pass through the film. These effects are responsible for the ***photoisomerization*** of DR1 mols. in the low-glass-transition-temp. polymer matrix.

ST ***photoisomeric*** chromophore doped polymer; directional spatial filtering optical threshold processing

IT ***Isomerization***
(cis-trans, photochem.; ***photoisomeric*** -chromophore-doped polymers for directional spatial filtering by optical threshold processing)

IT Memory devices

Nonlinear optical materials

Optical films

Optical filters

Optical modulation

Spatial light modulators

(***photoisomeric*** -chromophore-doped polymers for directional spatial filtering by optical threshold processing)

IT 86-28-2, N-Ethylcarbazole 2872-52-8, Disperse Red 1 25067-59-8, Poly(vinyl ***carbazole***)

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(***photoisomeric*** -chromophore-doped polymers for directional spatial filtering by optical threshold processing)

L5 ANSWER 12 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

TI Development of self adaptive image processing system by use of a ***photoisomeric*** organic dye film

AB A review with 8 refs. We demonstrate spatial filtering using the azo-chromophore-based ***nonlinear*** optical effect of the self-beam polarization-modulation. The real-time image processing scheme is described using the optical configuration, composed of an . . . action-probe beam system. Fourier-transform operation and an azo-chromophore-doped film as a spatial filter. As Disperse Red 1 doped in the N- ***polyvinylcarbazole*** film with N-ethylcarbazole, of low glass-transition-temp., exhibits the self polarization-modulation after the thin film transmission, a linearly-polarized probe beam into. . . of an original input image can be manipulated as they pass through the film. This effect is responsible for the ***photoisomerization*** of DR1 mols. in the low-glass-transition-temp. polymer matrix.

ST review self adaptive image processing; ***photoisomeric*** org dye film review

IT Imaging

Optical films

Optical filters

Spatial light modulators

(development of self adaptive image processing system by use of a ***photoisomeric*** org. dye film)

IT Memory effect
(optical; development of self adaptive image processing system by use of a ***photoisomeric*** org. dye film)

IT ***Isomerization***
(***photoisomerization*** ; development of self adaptive image processing system by use of a ***photoisomeric*** org. dye film)

IT 86-28-2, N-Ethylcarbazole 2872-52-8, C.I. Disperse Red 1 25067-59-8,
N- ***Polyvinylcarbazole***
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(development of self adaptive image processing system by use of a ***photoisomeric*** org. dye film)

L5 ANSWER 13 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

ST sol gel org inorg optical properties; xerogel pyrromethene optical pumping; merocyanine spiro oxazine ***photochromic*** sol gel; laser written grating DR1 sol gel; photorefractive sol gel ***carbazole*** DR1

IT ***Photochromism***
(and reverse- ***photochromism*** of spiro-oxazine in sol-gel matrix)

IT ***Nonlinear*** optical properties
(two-beam coupling; in photorefractive sol-gel materials)

IT 206867-72-3D, derivs. 206867-73-4D, derivs.
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(***photochromism*** and reverse- ***photochromism*** in sol-gel matrix)

IT 78-08-0, Vinyl triethoxysilane 998-30-1, Triethoxysilane 2031-67-6, Methyltriethoxysilane
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(***photochromism*** and reverse- ***photochromism*** of spiro-oxazine in sol-gel matrix from)

IT 86-74-8D, ***Carbazole***, silicon alkoxide deriv. 2872-52-8D, Disperse red 1, silicon alkoxide deriv.
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(photorefractive sol-gel materials using)

L5 ANSWER 14 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

AB . . . to their comparatively low glass-transition temps. Tg, an orientational enhancement of the photorefractive properties was obsd. Furthermore, the influence of ***photoisomerization*** (based on trans-cis-trans cycles) on the holog. properties could be detd. for the different chromophores. In addn., a class of fully functionalized polymers with azo chromophores and ***carbazole*** -units covalently attached to PMMA- and PU-backbones was synthesized. These systems show comparatively high glass transition temps. of more than 80.degree.C. The third type of materials investigated is a glass of triphenylamine with attached ***carbazole*** and ***NLO*** -chromophore moieties. It has a glass transition temp. of 120.degree.C. For the high-Tg materials, poling procedures - essential for the photorefractive properties - could be monitored in-situ by second-harmonic generation. Abs. values for the ***nonlinear*** Pockels coeffs. $\chi(2)(-\omega_1, \omega_2, 0)$ have been obtained by electro-optical measurements.

IT ***Isomerization***
(***photoisomerization*** ; photorefractive polymers for real-time holog.)

L5 ANSWER 15 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

TI Linear and second order ***nonlinear*** optical properties of novel ***photochromic*** materials

AB A new unique ***photochromic*** material which is based on a reversible formation - cleavage of a C-C bond is described. The bicyclic (spiro) binon deriv. ($\lambda_{max} = 480$ nm in toluene) undergoes photochem. and/or thermally induced ring opening to form the ***isomer*** ($\lambda_{max} = 640$ nm in toluene). This ***isomer*** form presents a conjugated donor-acceptor system and exhibits a considerable second-order optical nonlinearity as found by field induced SHG (EFISH) measurements. ***Photochromic*** conversion was also obsd. in the cryst. form indicated visually by a crystal red-to-green color change. The reversible ring opening - closure process in liq. and

polymeric solns. [PMMA and poly(***vinylcarbazole***)] was studied. Optical and thermal switching and the ***NLO*** efficiency of the guest-host polymer system are described.

ST bindon dimethylaminocinnamic aldehyde ***isomer***
photochromic conversion; ***nonlinear*** optical property
biindantrione dimethylaminocinnamic aldehyde; solvatochromism
photochromism indan deriv polymer host; polymethylmethacrylate
host indantrione deriv ***NLO*** ; ***polyvinylcarbazole*** host
indantrione deriv ***NLO***

IT ***Isomerization***
(cis-trans, photochem. and thermally induced; linear and second order
nonlinear optical properties of biindantrione deriv.
photochromic material in polymer hosts)

IT Optical switching
Photochromic materials
Photochromism
Second-order ***nonlinear*** optical properties
Solvatochromism

(linear and second order ***nonlinear*** optical properties of
biindantrione deriv. ***photochromic*** material in polymer hosts)
IT 56-23-5, Carbon tetrachloride, uses 67-66-3, Chloroform, uses 67-68-5,
DMSO, uses 71-43-2, Benzene, uses 75-05-8, Acetonitrile, uses
75-09-2, uses 108-88-3, Toluene, uses 110-82-7, Cyclohexane, uses
123-91-1, Dioxane, uses 9011-14-7, PMMA 25067-59-8, Poly(
vinylcarbazole)

RL: NUU (Other use, unclassified); USES (Uses)
(linear and second order ***nonlinear*** optical properties of
biindantrione deriv. ***photochromic*** material in polymer hosts)

IT 197023-27-1P 197023-28-2P
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP
(Preparation); RACT (Reactant or reagent)
(linear and second order ***nonlinear*** optical properties of
biindantrione deriv. ***photochromic*** material in polymer hosts)

IT 1707-95-5, Bindon 6203-18-5, p-(Dimethylamino)cinnamic aldehyde
RL: RCT (Reactant); RACT (Reactant or reagent)
(linear and second order ***nonlinear*** optical properties of
biindantrione deriv. ***photochromic*** material in polymer hosts)

L5 ANSWER 16 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

TI ***Carbazole*** -based multifunctional molecules for photorefractive
applications

AB A multifunctional ***photochromic*** mols. consist of a
carbazole part with a ***nonlinear*** optical chromophore unit
attached via an alkyl link to the N atom of the ***carbazole*** unit.
These compds. exhibit dual functions: photocond. and a second order
nonlinear optical activity. The photocharge transport and the
electrooptic functions are performed by two sep. constituents.
Photorefractive effect of ethyl(hexylsulfonylphenylazophenyl)aminododecylc
arbazole (I).

ST photorefractive ***carbazole*** based multifunctional mol holog;
nonlinear optical substituent ***carbazole*** deriv
photorefractive

IT Holography

Photorefractive effect

Photorefractive materials

(photorefractive effect and dynamic holog. recording using
carbazole -based multifunctional mols.)

IT ***Nonlinear*** optical properties
(two beam-coupling; of photorefractive ***carbazole*** -based
multifunctional mols.)

IT 196201-41-9

RL: PRP (Properties); TEM (Technical or engineered material use); USES
(Uses)

(photorefractive effect and dynamic holog. recording using
carbazole -based multifunctional mols.)

IT 129-79-3, 2,4,7-Trinitro-9-fluorenone

RL: TEM (Technical or engineered material use); USES (Uses)
(photorefractive effect and dynamic holog. recording using
carbazole -based multifunctional mols.)

L5 ANSWER 17 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

AB . . . are unique to semiconductor nanoclusters. For example, this

technique provided some useful kinetic and mechanistic information of size quantization effects, ***nonlinear*** optical effects, electro and ***photochromic*** effects, photocurrent ***generation***, photocatalysis and ***charge*** rectification properties of semiconductor nanoclusters. These properties are controlled by charge sepn., charge trapping and heterogeneous charge transfer at the. . .

IT Nanoparticles

Nonlinear optical properties

Quantum size effect

Semiconductor materials

(transient absorption spectroscopy of semiconductor nanoclusters)

L5 ANSWER 18 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

AB Photorefractive polymers which incorporate azo-dyes as the ***non*** - ***linear*** chromophore element, can be used not only for generating gratings by the photorefractive effect, but also by ***photoisomerization*** of the azo-dye. In the latter mechanism, repeated trans-cis ***isomerization*** causes the chromophore mols. to become aligned at right angles to the laser polarization direction, thereby making the material birefringent.. . . diffraction efficiency of the photorefractive gratings is a very sensitive function of the poling field strength, while that of the ***photoisomerization*** gratings is less so. In this work, we investigate the components diffracted from each of these grating formed in a. . .

IT ***Isomerization***

(***photoisomerization*** ; multiple-grating formation in photorefractive polymers with azo-dye chromophores)

IT 2872-52-8, Disperse RED1 25067-59-8, Poly(N- ***vinylcarbazole***)

119516-33-5, 4-N,N-Diethylamino-(E)-cinnamonnitrile

RL: PRP (Properties)

(multiple-grating formation in photorefractive polymers with azo-dye chromophores)

L5 ANSWER 19 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

AB . . . interfaces using second harmonic generation methods is described. Among the topics discussed are the dynamics of photoinduced structure changes, the ***transport*** of ***charge*** across an interface, the rotational motions of interfacial mols., intermol. energy transfer within the interface, interfacial photopolymn., and photoproceses at. . .

IT Electron exchange and Charge transfer

Isomerization

Polymerization

(photochem., photochem. and photophysics of liq. interfaces by second harmonic spectroscopy)

IT Optical ***nonlinear*** property

(second-harmonic generation, photochem. and photophysics of liq. interfaces by second harmonic spectroscopy)

L5 ANSWER 20 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

TI ***Nonlinear*** optical properties of organic MIS structures

AB An important particularity of org. semiconductors is their strong coupling between ***charge*** - ***transport*** and optical properties. By applying a voltage on a Metal-Insulator-Semiconductor (MIS) structure charges can be injected in the semiconductor under well-controlled conditions. Based on these principles, new mechanisms of electrooptic coupling and all-optical coupling (i.e., ***nonlinear*** optical) phenomena appear in org. MIS devices. The use of these properties for the characterization of ***charge*** - ***transport*** and for light-modulating devices are discussed. The example of the assocn. in a MIS structure of electrooptic coupling and photo-cond. is discussed. It leads to a new type of elec.-controlled ***photochromic*** device. A review with 16 refs.

ST ***nonlinear*** optical property org MIS review

IT Electrooptical effect

Optical ***nonlinear*** property

(***nonlinear*** optical properties and electrooptical effect of org. MIS structures)

IT Optical instruments

(modulators, ***nonlinear*** optical properties and electrooptical effect of org. MIS structures used in modulators)

L5 ANSWER 21 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN
TI Novel second harmonic ***generation*** from intermolecular
 charge -transfer complexes of styrylpyridinium salts in the
 crystalline state
ST styrylpyridinium salt charge transfer complex photophys; second harmonic
 generation styrylpyridinium ion pair; ***nonlinear*** optical property
 styrylpyridinium salt; photochem control second harmonic generation
IT ***Photochromism***
 (of intermol. charge-transfer complexes of styrylpyridinium salts in
 cryst. state)
IT Electron exchange and Charge transfer
 (photochem., novel second harmonic ***generation*** from intermol.
 charge -transfer complexes of styrylpyridinium salts in cryst.
 state)
IT Optical ***nonlinear*** property
 (second-harmonic generation, novel second harmonic ***generation***
 from intermol. ***charge*** -transfer complexes of styrylpyridinium
 salts in cryst. state)
IT 140651-15-6, 1-Methyl-4-(4-nitrostyryl)pyridinium tetraphenylborate
RL: PEP (Physical, engineering or chemical process); PRP (Properties);
PROC (Process)
 (novel second harmonic ***generation*** from intermol.
 charge -transfer complexes of styrylpyridinium salts in cryst.
 state)
IT 140651-16-7, 1-Methyl-4-(4-nitrostyryl)pyridinium methylbenzenesulfonate
140651-17-8, 1-Methyl-4-(4-nitrostyryl)pyridinium perchlorate
RL: PEP (Physical, engineering or chemical process); PRP (Properties);
PROC (Process)
 (novel second harmonic ***generation*** from intermol.
 charge -transfer complexes of styrylpyridinium salts in cryst.
 state in relation to)

L5 ANSWER 22 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN
AB . . . were carried out in a guest/host system subjected to an external
elec. field with and without the presence of a ***hole***
 transport agent. The guest was NNI, which has a moderate
second-order ***nonlinear*** optical coeff., the host was PMMA, and
the ***hole*** ***transport*** agent was DEH. In the presence of
DEH, the lifetime of the cis ***isomer*** of NNI detected by using the
HGR technique is lengthened by the application of an elec. field of
moderate strength. . . . obsd. when DEH is absent in the sample. The
result is interpreted as due to the stabilization of the cis
 isomer by the elec. field polarized DEH. The data obtained from
SHG and EO measurements appear to corroborate the HGR result.
IT Optical materials
 (***nonlinear*** , composite with PMMA, holog. gratings, laser
 induced relaxation of, elec. field effect on)
IT 9011-14-7, PMMA
RL: PRP (Properties)
 (contg. ***nonlinear*** optical compd. and ***hole***
 transport agent, elec. field effect on laser-induced holog.
 grating relaxation of)

L5 ANSWER 23 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN
AB . . . were carried out in a guest/host system subject to an external
elec. field with and without the presence of a ***hole***
 transport agent. The guest is 1-(4-nitrophenylazo) 2-naphthyl
isobutyrate (NNI), which has moderate second order ***nonlinear***
optical (***NLO***) coeff., the host is PMMA and the ***hole***
 transport agent is p-diethylaminobenzaldehyde diphenylhydrazone
(DEH). In the presence of DEH, the lifetime of the cis ***isomer***
of NNI detected by using the HGR technique is lengthened by the
application of an elec. field of moderate strength. . . . not obsd. when
DEH is absent in the sample. The result is interpreted as due to the
stabilization of the cis- ***isomer*** by the elec. field polarized
DEH. The data obtained from SHG and EO measurements appear to corroborate
the HGR result.
IT Electrooptical effect
Optical ***nonlinear*** property
 (of photorefractive polymer, elec. field dependence of laser-induced
 holog. grating relaxation in relation to)

L5 ANSWER 24 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN
TI Photorefraction in doped ***nonlinear*** organic polymers
AB The properties of a new class of materials exhibiting the photorefractive effect, doped optical ***nonlinear*** org. polymers, are described. Photorefraction (at 647.1 nm) is established by a combination of hologram erasability, correlation with photocond. and electrooptic response, and enhancement by external fields in numerous samples (178-533 .mu.m thick) of 2 ***nonlinear*** epoxy materials doped with ***hole***

transport agents based on p-(diethylamino)benzaldehyde diphenylhydrazone. Diffraction efficiencies ltoreq.0.1% are obsd. at bias fields near 100 kV/cm. A useful property of these materials is that poling of the ***nonlinear*** chromophores is partially reversible, permitting partial control of the grating readout independent of the space-charge field formed. The polarization anisotropy. . . than the index gratings, and (b) the phase shift of the index grating is near 90.degree., which cannot occur via ***photochromism***, heating, or any other process except photorefraction.

ST photorefraction doped ***nonlinear*** epoxy resin; ***hole***
transport agent epoxy photorefraction

IT Electrooptical effect

(of epoxy resins contg. ***hole*** ***transport*** agents,
photorefraction in relation to)

IT Epoxy resins, properties

RL: PRP (Properties)
(photorefraction of ***nonlinear*** optical, doped with
hole ***transport*** agents)

IT Optical materials

(***nonlinear***, epoxy resins doped with ***hole***
transport agents, photorefraction of)

IT 68189-23-1 83890-47-5

RL: PRP (Properties)

(***hole*** ***transport*** agents, ***nonlinear*** optical
epoxy resins doped with, photorefraction of)

IT 125061-60-1 128611-17-6

RL: PRP (Properties)

(photorefraction of ***nonlinear*** optical, doped with
hole ***transport*** agents)

L5 ANSWER 25 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

TI Novel second harmonic ***generation*** from intermolecular
charge -transfer complexes of styrylpyridinium tetraphenylborate

IT ***Photochromism***

(of methyl(nitrostyryl)pyridinium tetraphenylborate)

IT Optical ***nonlinear*** property

(harmonic ***generation***, second, from ***charge*** -transfer
complexes of styrylpyridinium)

L5 ANSWER 26 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

AB Defects and ***charge*** ***transport*** play crit. roles in the photorefractive behavior of electrooptic materials. Thus the photorefractive effect can be used as a noninvasive. . .

IT ***Photochromism***

(of chromium-doped gallium arsenide)

IT Optical ***nonlinear*** property

(four-wave mixing, of chromium-doped gallium arsenide)

IT 7440-47-3, Chromium, properties

RL: PRP (Properties)

(***nonlinear*** charge transfer and low temp. photorefractive
effects in gallium arsenide contg.)

L5 ANSWER 27 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

TI Configuration of vinyl radicals. The generation and trapping of each member of a configurationally ***isomeric*** pair of vinyl radicals

AB ***Isomeric*** vinyl free radicals were generated by treating Na naphthalenide with cis- and trans-3-chloro-3-hexene at 0.degree. and 27.degree. using tetrahydrofuran and 1,2-dimethylethane as solvents. The only detectable products were cis- and trans-3-hexene in 98% yield with the trans ***isomer*** predominating. Since these results excluded the possibility of a single linear sp radical or 2 ***isomeric***, configurationally stable, ***nonlinear*** sp₂ vinyl free radicals, it was concluded that the initial ***charge*** -transfer reaction

generates a ***nonlinear*** vinyl radical which is capable of

facile inversion at the radical site, but the radical is trapped before complete equilibration with its configurational ***isomer*** is achieved. A mechanism by which the interconverting free radical can be trapped is postulated.

=> d all 4-27

L5 ANSWER 4 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:693438 CAPLUS
DN 140:383024
ED Entered STN: 05 Sep 2003
TI Holographic gratings in hybrid sol-gel films
AU Raschella, R.; Marino, I.-G.; Lottici, P. P.; Bersani, D.; Lorenzi, A.; Montenero, A.
CS INFM, Univ. degli Studi di Parma, Parma, 43100, Italy
SO Proceedings of SPIE-The International Society for Optical Engineering (2003), 5123(Advanced Optical Devices, Technologies, and Medical Applications), 117-124
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
AB Org.-inorg. films based on SiO₂, contg. Disperse Red 1 (DR1), ***carbazole*** units and 2,4,7-trinitro-9-fluorenone (TNF), have been prep'd. by a sol-gel technique. Diffraction gratings have been produced through different effects: photoinduced birefringence and photorefractivity, using 488.0 nm and 632.8 nm light, resp. Pure polarization holog. birefringence gratings have been investigated and diffraction efficiencies higher than those obtained by light intensity modulation have been measured. The study of the temporal behavior of the diffraction efficiencies makes possible the identification of different processes involved in the DR1 mol. orientation: angular hole burning (AHB), angular redistribution (AR), Cis mols. gain has been detd. by two-beam coupling (2BC) measurements. The effect of the polarization of the writing beams on the grating and of a circularly polarized ***photoisomerizing*** radiation during grating erasure has been interpreted in terms of an orientation contribution to the grating formation.
ST polarization holog birefringence grating hybrid sol gel film
IT ***Isomerization***
(cis-trans, photochem.; recording of holog. gratings in hybrid org.-inorg. films based on SiO₂ sol-gel films contg. Disperse Red 1 and ***carbazole*** units and trinitrofluorenone)
IT Birefringence
(photoinduced; recording of holog. gratings in hybrid org.-inorg. films based on SiO₂ sol-gel films contg. Disperse Red 1 and ***carbazole*** units and trinitrofluorenone)
IT Holographic diffraction gratings
Holographic recording materials
Hybrid organic-inorganic materials
Molecular orientation
Photorefractive effect
Sol-gel processing
(recording of holog. gratings in hybrid org.-inorg. films based on SiO₂ sol-gel films contg. Disperse Red 1 and ***carbazole*** units and trinitrofluorenone)
IT ***Nonlinear*** optical properties
(two-beam-coupling; recording of holog. gratings in hybrid org.-inorg. films based on SiO₂ sol-gel films contg. Disperse Red 1 and ***carbazole*** units and trinitrofluorenone)
IT 7647-01-0, Hydrochloric acid, uses
RL: CAT (Catalyst use); USES (Uses)
(recording of holog. gratings in hybrid org.-inorg. films based on SiO₂ sol-gel films contg. Disperse Red 1 and ***carbazole*** units and trinitrofluorenone)
IT 685091-04-7
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(recording of holog. gratings in hybrid org.-inorg. films based on SiO₂

sol-gel films contg. Disperse Red 1 and ***carbazole*** units and trinitrofluorenone)

IT 919-30-2, 3-Aminopropyltriethoxysilane 2872-52-8, Disperse Red 1
24801-88-5, 3-(Triethoxysilyl)propylisocyanate 73500-82-0,
Carbazole -9-carbonyl chloride
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(recording of holog. gratings in hybrid org.-inorg. films based on SiO₂
sol-gel films contg. Disperse Red 1 and ***carbazole*** units and trinitrofluorenone)

IT 129-79-3, 2,4,7-Trinitro-9-fluorenone
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(sensitizer; recording of holog. gratings in hybrid org.-inorg. films based on SiO₂ sol-gel films contg. Disperse Red 1 and ***carbazole*** units and trinitrofluorenone).

RE.CNT 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L5 ANSWER 5 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

AN 2003:99139 CAPLUS

DN 138:375505

ED Entered STN: 09 Feb 2003

TI Molecular engineering of dye-doped polymers for optoelectronics

AU Ishchenko, Alexander

CS Institute of Organic Chemistry, National Academy of Sciences of Ukraine, Kiev, 02094/94, Ukraine

SO Polymers for Advanced Technologies (2002), 13(10-12), 744-752

CODEN: PADTE5; ISSN: 1042-7147

PB John Wiley & Sons Ltd.

DT Journal

LA English

CC 73-4 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

AB The main approaches to mol. engineering of prospective dye-doped polymer matrixes for optoelectronics were considered. The advantages of such matrixes over polymers and dyes sep. were analyzed. These advantages can be realized in the case where a doping of polymers by low-mol.-wt. dyed impurities does not essentially distort spectral, luminescent and ***nonlinear*** optical properties of the individual components of polymer compn. The influence of polymer nature and chem. constitution of org. dyes on photophys. and photochem. properties of these matrixes was analyzed. Processes of dye aggregation in polymers were characterized. Their influence on photophys. properties and the photochem. stability of dye-doped materials is discussed. The different approaches for struggle with it is offered. The influence of the method of introduction of a dye into a polymer on the output parameters of dyed materials was considered. The main paths of energy degrdn. of electronic excitation in such materials - internal conversion, electron transfer and

photoisomerization - were analyzed. The role of dyes in the process of generation, in recombination and in the carriage of charges in photoconductive polymers is discussed. The prospects for the application of dye-doped polymer materials as passive Q-switches of solid-state lasers, as active laser media with large Stokes shift, as luminescent solar converters and as electroluminescent emitters were demonstrated.

ST dye doped conjugated polymer optoelectronics polyurethane
electroluminescent device; solid state laser solar converter dye doped

IT conjugated polymer
IT Polymers, properties
RL: DEV (Device component use); PRP (Properties); USES (Uses)
. (conjugated; mol. engineering of dye-doped polymers for
optoelectronics)

IT Doping
Dyes
Electroluminescent devices
Optoelectronics
Solid state lasers
(mol. engineering of dye-doped polymers for optoelectronics)

IT Polyurethanes, properties
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(mol. engineering of dye-doped polymers for optoelectronics)

IT 51829-02-8 80993-83-5 101491-20-7
RL: DEV (Device component use); MOA (Modifier or additive use); PRP
(Properties); USES (Uses)
(mol. engineering of dye-doped polymers for optoelectronics)

IT 25067-59-8, ***Polyvinylcarbazole*** 55774-96-4,
Poly-N-epoxypropylcarbazole
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(mol. engineering of dye-doped polymers for optoelectronics)

RE.CNT 49 THERE ARE 49 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L5 ANSWER 6 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:24319 CAPLUS
DN 139:187903
ED Entered STN: 12 Jan 2003
TI CdSe/CdS core/shell quantum dots as sensitizer of a photorefractive polymer composite
AU Binks, D. J.; Bant, S. P.; West, D. P.; O'Brien, P.; Malik, M. A.
CS Dept. Chem., Univ. Manchester, Manchester, UK
SO Journal of Modern Optics (2003), 50(2), 299-310
CODEN: JMOPEW; ISSN: 0950-0340
PB Taylor & Francis Ltd.
DT Journal
LA English
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 74
AB CdSe/CdS core/shell, tri-n-octylphosphine oxide passivated, quantum dots are used to sensitize a photorefractive polymer composite. The composite also consists of poly(N- ***vinylcarbazole***) as the nominally ***charge*** ***transporting*** matrix and an electrooptic chromophore. The efficacy of sensitization and consequent photorefractive performance is investigated using transmission spectroscopy and ellipsometry, two-beam coupling and degenerate four-wave mixing expts. The photorefractive nature of the photoinduced grating is confirmed by the observation of asym. two-beam coupling. Four-wave mixing reveals record diffraction efficiencies for a nanoparticle-sensitized photorefractive polymer at the field levels applied (1.3% at 70 V. .mu.m-1). A recently developed anal. technique is used to ext. space-charge field rise time values from degenerate four-wave mixing transients. In turn, anal. of the dependence of the rise time on applied field is used to det. the zero-field charge dissocn. efficiency to be 3.6.times. 10-5.+-0.5.times. 10-5. It is further shown that the magnitude of this parameter accounts for most of the difference in photorefractive response rate between the present material and a similar C60 sensitized composite.
ST photorefractive polymer composite cadmium sulfide selenide quantum dot sensitizer
IT ***Isomerization***
(cis-trans, photochem.; photorefractive poly(***vinylcarbazole***)-based composite contg. (ethylhexyloxydimethylnitrophenylazo)benzene sensitized by octylphosphine oxide passivated CdSe/CdS quantum dots in relation to)
IT Degenerate four wave mixing
Ellipsometry
Holographic diffraction gratings
Nanoparticles
Photorefractive effect
Photorefractive materials
Quantum dot devices
Refractive index
Space charge
(photorefractive poly(***vinylcarbazole***)-based composite contg. (ethylhexyloxydimethylnitrophenylazo)benzene sensitized by octylphosphine oxide passivated CdSe/CdS quantum dots)
IT Holographic recording materials
(photorefractive poly(***vinylcarbazole***)-based composite contg. (ethylhexyloxydimethylnitrophenylazo)benzene sensitized by octylphosphine oxide passivated CdSe/CdS quantum dots in relation to)
IT Birefringence
(transient; photorefractive poly(***vinylcarbazole***)-based composite contg. (ethylhexyloxydimethylnitrophenylazo)benzene sensitized by octylphosphine oxide passivated CdSe/CdS quantum dots)
IT ***Nonlinear*** optical properties
(two-beam-coupling; photorefractive poly(***vinylcarbazole***)-based composite contg. (ethylhexyloxydimethylnitrophenylazo)benzene sensitized by octylphosphine oxide passivated CdSe/CdS quantum dots)

IT 78-50-2, Tri-n-octylphosphine oxide 1306-23-6, Cadmium sulfide,
properties 1306-24-7, Cadmium selenide, properties 25067-59-8, Poly(N-
vinylcarbazole) 176681-76-8, EHDNPB
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP
(Physical process); PROC (Process)
(photorefractive poly(***vinylcarbazole***)-based composite contg.
(ethylhexyloxydimethylnitrophenylazo)benzene sensitized by
octylphosphine oxide passivated CdSe/CdS quantum dots)

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L5 ANSWER 7 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

AN 2003:12199 CAPLUS

DN 138:278013

ED Entered STN: 07 Jan 2003

TI Optical nonlinearity of fullerene-doped polymer nanocomposites

AU Antipov, O. L.; Yurasova, I. V.; Domrachev, G. A.

CS Institute of Applied Physics, Russian Academy of Sciences, Nizhnii Novgorod, 603600, Russia

SO Quantum Electronics (2002), 32(9), 776-780

CODEN: QUELEZ; ISSN: 1063-7818

PB Turpion Ltd.

DT Journal

LA English

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

AB The mechanism of optical nonlinearity of new polymer composites based on a conducting polymer [poly(9- ***vinylcarbazole***)] and fullerenes C70 and C60 was studied both exptl. and theor. The ***nonlinear*** -optical studies of self-action and coupling of two 633-nm beams from a He-Ne laser were performed, and variations in the absorption spectra of the composites illuminated by a laser beam were studied. A giant inertial nonlinearity of org. materials is caused by the difference in polarizabilities of fullerene mols. and their anion radicals, which are formed upon absorption of photons and charge transfer by poly(9- ***vinylcarbazole***) mols.

ST fullerene polyvinyl ***carbazole*** ***nonlinear*** optical property nanocomposite

IT Conducting polymers
Nanocomposites

Nonlinear optical susceptibility

Photochromism

Photorefractive effect

(optical nonlinearity of fullerene-doped polymer nanocomposites)

IT 25067-59-8, Poly(9- ***vinylcarbazole***) 99685-96-8, Fullerene (C60)
115383-22-7, Fullerene C70

RL: PRP (Properties)

(optical nonlinearity of fullerene-doped polymer nanocomposites)

RE.CNT 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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L5 ANSWER 8 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN
 AN 2002:857489 CAPLUS

DN 138:264682

ED Entered STN: 12 Nov 2002

TI Synthesis, properties and ***photochromism*** of novel charge transfer compounds with Keggin anions and protonated 2,2'-biquinoline

AU Gamelas, Jose A. F.; Cavaleiro, Ana M. V.; de Matos Gomes, Etelvina; Belsley, Michael; Herdtweck, Eberhardt

CS Department of Chemistry, University of Aveiro, Aveiro, 3810-193, Port.

SO Polyhedron (2002), 21(25-26), 2537-2545

CODEN: PLYHDE; ISSN: 0277-5387

PB Elsevier Science Ltd.

DT Journal

LA English

CC 78-7 (Inorganic Chemicals and Reactions)

Section cross-reference(s): 73

OS CASREACT 138:264682

AB Several novel compds. with protonated 2,2'-biquinoline (biqui) and Keggin polyoxoanions (.alpha.- ***isomers***), (Hbiqui)_m[XM₁₂O₄₀].cntdot.n(sol v), X = P (m = 3), Si (m = 4); M = Mo, W; n = 0, 3; solv = H₂O, DMF, were synthesized and characterized by anal., spectroscopic and x-ray diffraction techniques. Electronic spectroscopy (visible/UV) indicated the presence of intermol. charge transfer between the org. and inorg. moieties in the solid state. Evidence for the existence of intermol. electronic interaction in soln. was found for compds. with [SiW₁₂O₄₀]⁴⁻, quite uncommon for charge transfer compds. based on Keggin anions. A single crystal x-ray diffraction study was performed on (Hbiqui)₄[SiW₁₂O₄₀].cntdot.3DMF crystals, but the refinements revealed highly disordered 2,2'-biquinoline mols. and .alpha.-[SiW₁₂O₄₀]⁴⁻ anions. Photosensitivity to sunlight and to W-lamp visible light was assessed for all compds. ***Photochromic*** properties were found for solids with [XMo₁₂O₄₀]_m- Keggin anions. Redn. of these anions upon irradn. was obsd. by diffuse reflectance and EPR spectroscopy. After a min. of 5 h under sunlight, the extent of anion redn. followed the order (Hbiqui)₃[PMo₁₂O₄₀].cntdot.3DMF > (Hbiqui)₄[SiMo₁₂O₄₀].cntdot.3DMF > (Hbiqui)₃[PMo₁₂O₄₀] > (Hbiqui)₄[SiMo₁₂O₄₀].cntdot.4H₂O. The Kurtz powder test was used to evaluate the 2nd-order ***nonlinear*** optical properties of the prep'd. compds. (Hbiqui)₄[SiW₁₂O₄₀].cntdot.3H₂O originated a 2nd harmonic generation signal with intensity apprx. 15% that of urea for 1064 nm radiation.

ST Keggin biquinolinium charge transfer prepn UV; ***nonlinear*** optical property tungstosilicate biquinolinium charge transfer; ***photochromism*** molybdophosphate molybdosilicate biquinolinium charge transfer; biquinolinium molybdophosphate molybdosilicate tungstophosphate tungstosilicate charge transfer prepn UV

IT Heteropoly acids

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation) (Keggin; prepn., properties and ***photochromism*** of charge transfer compds. with Keggin anions and 2,2'-biquinolinium)

IT ***Photochromism*** (in molybdosilicate and molybdophosphate biquinolinium charge transfer complexes)

IT Second-harmonic ***generation*** (of tungstosilicate biquinolinium ***charge*** transfer complex)

IT Charge transfer complexes

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(prepn., properties and ***photochromism*** of charge transfer compds. with Keggin anions and 2,2'-biquinolinium)

IT UV and visible spectra
(solid-state and soln.; of charge transfer compds. with Keggin anions and 2,2'-biquinolinium)

IT 119-91-5, 2,2'-Biquinoline 11089-20-6 12027-43-9 51429-74-4
395071-70-2

RL: RCT (Reactant); RACT (Reactant or reagent)
(for prepn. of charge transfer compds. with Keggin anions and 2,2'-biquinolinium)

IT 503014-03-7P
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(prepn. and UV-visible spectra)

IT 503014-11-7P 503014-13-9P
RL: SPN (Synthetic preparation); PREP (Preparation)
(prepn. of charge transfer compds. with Keggin anions and 2,2'-biquinolinium)

IT 503014-07-1P 503014-09-3P 503014-15-1P 503014-17-3P
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(prepn., UV-visible spectra and ***photochromism***)

IT 503014-05-9P
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(prepn., UV-visible spectra and second-harmonic generation)

RE.CNT 50 THERE ARE 50 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L5 ANSWER 9 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2002:698031 CAPLUS
DN 138:170920
ED Entered STN: 15 Sep 2002
TI Optical nonlinearity of C70-sensitized photorefractive compositions caused by production of anion-radicals
AU Antipov, O. L.; Yurasova, I. V.; Domrachev, G. A.
CS Institute of Applied Physics of the Russian Academy of Science, Nizhny Novgorod, 603950, Russia
SO Trends in Optics and Photonics (2002), 64(Organic Thin Films for Photonic Applications), 60-64
CODEN: TOPRBS
PB Optical Society of America
DT Journal
LA English
CC 37-5 (Plastics Manufacture and Processing)
Section cross-reference(s): 73
AB The origin of the optical nonlinearity of an org. polymeric compn. including fullerene C70 and poly(9- ***vinylcarbazole***) (PVK) was investigated by two-beam coupling and self-action of a cw laser beam at 633 nm, and spectroscopically. The local nonlinearity of the photorefractive polymer was found to be caused by the difference in polarizability of fullerene C70 and its light-induced anion-radicals, C-70, C2-70, etc.
ST ***photochromism*** optical nonlinearity ***polyvinylcarbazole*** fullerene
IT ***Nonlinear*** optical properties
Photochromism
Polarizability
(optical nonlinearity of C70-sensitized photorefractive compns. caused by prodn. of anion-radicals)
IT 25067-59-8, Poly(9- ***vinylcarbazole***) 115383-22-7, C70 Fullerene
RL: PRP (Properties)
(optical nonlinearity of C70-sensitized photorefractive compns. caused by prodn. of anion-radicals)

RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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L5 ANSWER 10 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1998:778338 CAPLUS
DN 130:131472

ED Entered STN: 14 Dec 1998
TI Multi-grating in photorefractive composites containing ***nonlinear*** chromophore azo-dye 1-n-butoxyl-2,5-dimethyl-4-(4'-nitrophenylazo)benzene
AU Wang, Feng; Chen, Zhijian; Gong, Qihuang; Chen, Yiwang; Chen, Huiying
CS Department of Physics, Mesoscopic Physics Laboratory, Peking University, Beijing, 100871, Peop. Rep. China
SO Proceedings of SPIE-The International Society for Optical Engineering (1998), 3554(Photorefractive Materials: Phenomena and Related Applications II), 224-228
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 74
AB Distinct electroabsorption grating and ***photoisomerization***

grating as well as photorefractive grating were obsd. in the composite consisting of 1-n-butoxyl-2,5-dimethyl-4-(4'-nitrophenylazo)benzene (BDMNPAB): poly(N-***vinylcarbazole***) (PVK): 2,4,7-trinitro-9-fluorenone (TNF) in a wt. ratio of 44:55:1. Based on the quick translation technique of two-beam coupling exptl. geometry, the authors measured the electroabsorption grating to be 6-7 cm⁻¹, and

photoisomeric effect also brought an absorption grating of 2-3 cm⁻¹. ***Photoisomeric*** effect caused index grating was sep'd. from the others by analyzing the dynamic behavior of the gratings, and an amplitude between 1 times. 10⁻⁴ apprx. 2 times. 10⁻⁴ was obtained.

ST multi grating photorefractive composite ***nonlinear*** chromophore azo dye; photorefractive grating ***photoisomerization*** electroabsorption two beam coupling

IT ***Nonlinear*** optical properties

(beam coupling; multi-grating in photorefractive composites contg. ***nonlinear*** chromophore azo-dye 1-n-butoxyl-2,5-dimethyl-4-(4'-nitrophenylazo)benzene)

IT Azo dyes

Electric field effects

Electrooptical absorption

Photorefractive gratings

(multi-grating in photorefractive composites contg. ***nonlinear*** chromophore azo-dye 1-n-butoxyl-2,5-dimethyl-4-(4'-nitrophenylazo)benzene)

IT ***Isomerization***

(***photoisomerization*** ; multi-grating in photorefractive composites contg. ***nonlinear*** chromophore azo-dye 1-n-butoxyl-2,5-dimethyl-4-(4'-nitrophenylazo)benzene)

IT 129-79-3, 2,4,7-Trinitro-9-fluorenone 25067-59-8, Poly(N-***vinylcarbazole***) ~ 210281-60-0

RL: DEV (Device component use); PRP (Properties); USES (Uses)
(multi-grating in photorefractive composites contg. ***nonlinear*** chromophore azo-dye 1-n-butoxyl-2,5-dimethyl-4-(4'-nitrophenylazo)benzene)

RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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L5 ANSWER 11 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

AN 1998:429870 CAPLUS

DN 129:181774

ED Entered STN: 13 Jul 1998

TI ***Photoisomeric*** -chromophore-doped polymers for directional spatial filtering by optical threshold processing

AU Egami, C.; Suzuki, Y.; Aoshima, Y.; Sugihara, O.; Okamoto, N.

CS Faculty of Engineering, Department of Electrical and Electronic Engineering, Shizuoka University, 3-5-1, Johoku, Hamamatsu, Shizuoka, 432, Japan

SO Journal of the Optical Society of America B: Optical Physics (1998), 15(7), 1985-1991

CODEN: JOBPDE; ISSN: 0740-3224

PB Optical Society of America

DT Journal

LA English

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 74

AB We demonstrate spatial filtering by using the azo-chromophore-based

nonlinear optical effect of self-beam polarization modulation and optical threshold processing. The real-time image-processing scheme is described by use of an optical configuration composed of an action-beam-probe-beam system, Fourier-transform operation, and an azo-chromophore-doped film as a spatial filter. As Disperse Red 1 dye (DR1) doped in an N-poly(***vinylcarbazole***) (PVK) film with N-ethylcarbazole (ECZ) of low glass-transition temp. exhibits self-polarization rotation after thin-film transmission, a linearly polarized probe beam in the film is obsd., even through a crossed analyzer. In addn., this film permits optical threshold processing by introducing an action beam with different intensity and wavelength from those of the probe beam with object information. Changing the action-beam intensity results in a decrease or an increase in the transmitted probe-beam power through the analyzer. When a DR1-PVK-ECZ film is placed at the Fourier plane on the probe-beam path, the filter functions can be modulated in real time by manipulation of the intensity ratio between the action beam and the spatial-frequency components at the film plane. The spatial frequencies of an original input image can be manipulated as they pass through the film. These effects are responsible for the ***photoisomerization*** of DR1 mols. in the low-glass-transition-temp. polymer matrix.

ST ***photoisomeric*** chromophore doped polymer; directional spatial filtering-optical threshold processing

IT ***Isomerization***

(cis-trans, photochem.; ***photoisomeric*** -chromophore-doped polymers for directional spatial filtering by optical threshold processing)

IT Memory devices

 Nonlinear optical materials

Optical films

Optical filters

Optical modulation

Spatial light modulators

(***photoisomeric*** -chromophore-doped polymers for directional spatial filtering by optical threshold processing)

IT 86-28-2, N-Ethylcarbazole 2872-52-8, Disperse Red 1 25067-59-8,
Poly(vinyl ***carbazole***)

RL: PRP (Properties); TEM (Technical or engineered material use); USES
(Uses)

(***photoisomeric*** -chromophore-doped polymers for directional spatial filtering by optical threshold processing)

RE.CNT 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L5 ANSWER 12 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1998:417178 CAPLUS
DN 129:142426
ED Entered STN: 09 Jul 1998
TI Development of self adaptive image processing system by use of a ***photoisomeric*** organic dye film
AU Egami, Chikara; Sugihara, Okihiro; Fujimura, Hisashi; Okamoto, Naomichi
CS Fac. Eng., Shizuoka Univ., Hamamatsu, Japan
SO Shizuoka Daigaku Kogakubu Kenkyu Hokoku (1997), 48, 1-6
CODEN: SDKKAT; ISSN: 0583-0915
PB Shizuoka Daigaku Kogakubu
DT Journal; General Review
LA Japanese
CC 74-0 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 73
AB A review with 8 refs. We demonstrate spatial filtering using the azo-chromophore-based ***nonlinear*** optical effect of the self-beam polarization-modulation. The real-time image processing scheme is described using the optical configuration, composed of an action-probe beam system. Fourier-transform operation and an azo-chromophore-doped film as a spatial filter. As Disperse Red 1 doped in the N- ***polyvinylcarbazole*** film with N-ethylcarbazole, of low glass-transition-temp., exhibits the self polarization-modulation after the thin film transmission, a linearly-polarized probe beam into the film is obsd. even through a crossed analyzer. When the DR1/PVK/ECZ film is placed at the Fourier plane on the probe beam path, the filter functions can be modulated in real time. The spatial frequencies of an original input image can be manipulated as they pass through the film. This effect is responsible for the ***photoisomerization*** of DR1 mols. in the low-glass-transition-temp. polymer matrix.
ST review self adaptive image processing; ***photoisomeric*** org dye film review
IT Imaging
Optical films
Optical filters
Spatial light modulators
(development of self adaptive image processing system by use of a ***photoisomeric*** org. dye film)
IT Memory effect
(optical; development of self adaptive image processing system by use of a ***photoisomeric*** org. dye film)
IT ***Isomerization***
(***photoisomerization*** ; development of self adaptive image processing system by use of a ***photoisomeric*** org. dye film)
IT 86-28-2, N-Ethylcarbazole 2872-52-8, C.I. Disperse Red 1 25067-59-8,
N- ***Polyvinylcarbazole***
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(development of self adaptive image processing system by use of a ***photoisomeric*** org. dye film)

L5 ANSWER 13 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1998:261567 CAPLUS
DN 128:328463
ED Entered STN: 08 May 1998
TI Organic-inorganic solids by sol-gel processing: optical applications
AU Boilot, J. -P.; Biteau, J.; Chaput, F.; Gacoin, T.; Brun, A.; Darracq, B.; Georges, P.; Levy, Y.
CS Groupe de Chimie du Solide, Physique de la Matiere Condensee, URA CNRS 1254 D, Ecole Polytechnique, Palaiseau, 91128, Fr.
SO Pure and Applied Optics (1998), 7(2), 169-177
CODEN: PAOAE3; ISSN: 0963-9659
PB Institute of Physics Publishing
DT Journal
LA English
CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 38, 66
AB We have developed pure inorg. and hybrid org.-inorg. solids by sol-gel processing of silicon alkoxides. Dense gels were obtained at room temp., in any desired shape, including thin films, and we are able to trap org.

mols. or clusters. Gels can be polished and exhibit optical transmission in the visible range similar to that of high-temp. silica glasses. Concerning gel-mol. and gel-nanocrystal composites, the diversity of the organofunctional alkoxide precursors allows us to modify the optical properties by changing the nature and the strength of chem. and electronic interactions between the optically active guest system and the solid host matrix.

- ST sol gel org inorg optical properties; xerogel pyrromethene optical pumping; merocyanine spiro oxazine ***photochromic*** sol gel; laser written grating DR1 sol gel; photorefractive sol gel ***carbazole*** DR1
- IT ***Photochromism***
(and reverse- ***photochromism*** of spiro-oxazine in sol-gel matrix)
- IT Solid state lasers
Xerogels
(dense xerogels for tunable solid state laser applications)
- IT Laser induced grating
(in disperse red 1 doped sol-gel matrix)
- IT Photorefractive effect
(in sol-gel materials using functionalized silicon alkoxides)
- IT Optical pumping
(of pyrromethene-597 in dense xerogel)
- IT Optical properties
Optical transmission
Sol-gel processing
(optical applications of org.-inorg. solids by sol-gel processing)
- IT ***Nonlinear*** optical properties
(two-beam coupling; in photorefractive sol-gel materials)
- IT 137829-79-9, Pyrromethene-597
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(dense xerogels for tunable solid state laser applications)
- IT 2872-52-8, Disperse red 1
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(laser-written gratings in doped sol-gel matrix)
- IT 206867-72-3D, derivs. 206867-73-4D, derivs.
RL: PEP (Physical, engineering or chemical process); PRP (Properties);
PROC (Process)
(***photochromism*** and reverse- ***photochromism*** in sol-gel matrix)
- IT 78-08-0, Vinyl triethoxysilane 998-30-1, Triethoxysilane 2031-67-6,
Methyltriethoxysilane
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(***photochromism*** and reverse- ***photochromism*** of
spiro-oxazine in sol-gel matrix from)
- IT 86-74-8D, ***Carbazole***, silicon alkoxide deriv. 2872-52-8D,
Disperse red 1, silicon alkoxide deriv.
RL: PEP (Physical, engineering or chemical process); PRP (Properties);
PROC (Process)
(photorefractive sol-gel materials using)
- RE.CNT 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD
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L5 ANSWER 14 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN
 AN 1997:703445 CAPLUS
 DN 128:8701
 ED Entered STN: 08 Nov 1997
 TI New photorefractive polymers for real-time holography
 AU Schloter, S.; Hofmann, U.; Hagen, R.; Hohle, C.; Ewert, K.; Strohriegl, P.; Eisenbach, C.-D.; Schmidt, H.-W.; Haarer, D.
 CS Lehrstuhl Experimentalphysik IV, Universitaet Bayreuth, Bayreuth, 95440, Germany
 SO Proceedings of SPIE-The International Society for Optical Engineering (1997), 3144(Xerographic Photoreceptors and Organic Photorefractive Materials II), 142-153
 CODEN: PSISDG; ISSN: 0277-786X
 PB SPIE-The International Society for Optical Engineering
 DT Journal
 LA English
 CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
 Section cross-reference(s): 38
 AB We investigated polymeric materials based on polysiloxane (PSX), polymethylmethacrylate (PMMA), polyurethane (PU), as well as a triphenylamine-based glass (DRDCTA) with respect to their photorefractive properties. Elec.-field dependencies of the two-beam coupling gain, diffraction efficiencies, refractive index amplitudes and holog. rise-times could be obtained by means of two-wave mixing and degenerate four-wave mixing measurements. The examd. PSX polymer systems were composed of a photoconducting polysiloxane host doped with trinitrofluorenone (TNF) as a sensitizing moiety and various chromophores, namely, an azo deriv., a stilbene deriv. and a tolan deriv. Due to their comparatively low glass-transition temps. Tg, an orientational enhancement of the photorefractive properties was obsd. Furthermore, the influence of ***photoisomerization*** (based on trans-cis-trans cycles) on the holog. properties could be detd. for the different chromophores. In addn., a class of fully functionalized polymers with azo chromophores and ***carbazole*** -units covalently attached to PMMA- and PU-backbones was synthesized. These systems show comparatively high glass transition temps. of more than 80.degree.C. The third type of materials investigated is a glass of triphenylamine with attached ***carbazole*** and ***NLO*** -chromophore moieties. It has a glass transition temp. of 120.degree.C. For the high-Tg materials, poling procedures - essential for the photorefractive properties - could be monitored in-situ by second-harmonic generation. Abs. values for the ***nonlinear*** Pockels coeffs. .chi.(2)(-.omega.;.omega.,0) have been obtained by electro-optical measurements.
 ST photorefractive polymer real time holog diffraction; photoconducting polysiloxane host trinitrofluorenone dopant holog
 IT Testing of materials
 (nondestructive; photorefractive polymers for real-time holog.)
 IT ***Isomerization***
 (***photoisomerization*** ; photorefractive polymers for real-time holog.)
 IT Degenerate four wave mixing
 Dielectric polarization
 Holography
 Optical diffraction
 Photorefractive materials
 Refractive index
 Second-harmonic generation

IT Two wave mixing
(photorefractive polymers for real-time holog.)
IT Polymers, properties
Polysiloxanes, properties
RL: PRP (Properties); TEM (Technical or engineered material use); USES
(Uses)
(photorefractive polymers for real-time holog.)
IT Polyurethanes, properties
Polyurethanes, properties
RL: PRP (Properties); TEM (Technical or engineered material use); USES
(Uses)
(polyamine-; photorefractive polymers for real-time holog.)
IT Polyamines
Polyamines
RL: PRP (Properties); TEM (Technical or engineered material use); USES
(Uses)
(polyurethane-; photorefractive polymers for real-time holog.)
IT 129-79-3 153800-56-7 198827-68-8 198827-69-9
RL: MOA (Modifier or additive use); USES (Uses)
(photorefractive polymers for real-time holog.)
IT 9011-14-7, Polymethylmethacrylate 150528-92-0 181427-94-1
198827-72-4 198827-73-5 198827-75-7 198827-84-8
RL: PRP (Properties); TEM (Technical or engineered material use); USES
(Uses)
(photorefractive polymers for real-time holog.)

RE.CNT 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L5 ANSWER 15 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

AN 1997:674996 CAPLUS

DN 127:294024

ED Entered STN: 24 Oct 1997

TI Linear and second order ***nonlinear*** optical properties of novel
photochromic materials

AU Zinger, Baruch; Schaer, Pnina; Berkovic, Gary; Meshulam, Guilia; Kotler, Zvi; Shapiro, Lev; Mazor, Royi; Khodorkovsky, Vladimir

CS Nonlinear Optics Group SOREQ NRC, Yavne, 81800, Israel

SO Proceedings of SPIE-The International Society for Optical Engineering (1997), 3135(Precision Plastic Optics for Optical Storage, Displays, Imaging, and Communications), 71-78

CODEN: PSISDG; ISSN: 0277-786X

PB SPIE-The International Society for Optical Engineering

DT Journal

LA English

CC 37-5 (Plastics Manufacture and Processing)

Section cross-reference(s): 36, 73

AB A new unique ***photochromic*** material which is based on a

reversible formation - cleavage of a C-C bond is described. The bicyclic (spiro) bindon deriv. (.lambda.max = 480 nm in toluene) undergoes photochem. and/or thermally induced ring opening to form the ***isomer*** (.lambda.max= 640 nm in toluene). This ***isomer*** form presents a conjugated donor-acceptor system and exhibits a considerable second-order optical nonlinearity as found by field induced SHG (EFISH) measurements. ***Photochromic*** conversion was also obsd. in the cryst. form indicated visually by a crystal red-to-green color change. The reversible ring opening - closure process in liq. and polymeric solns. [PMMA and poly(***vinylcarbazole***)] was studied. Optical and thermal switching and the ***NLO*** efficiency of the guest-host polymer system are described.

ST bindon dimethylaminocinnamic aldehyde ***isomer***
photochromic conversion; ***nonlinear*** optical property
biindantrione dimethylaminocinnamic aldehyde; solvatochromism
photochromism indan deriv polymer host; polymethylmethacrylate
host indantrione deriv ***NLO*** ; ***polyvinylcarbazole*** host
indantrione deriv ***NLO***

IT ***Isomerization***
(cis-trans, photochem. and thermally induced; linear and second order
nonlinear optical properties of biindantrione deriv.
photochromic material in polymer hosts)

IT Optical switching
Photochromic materials
Photochromism
Second-order ***nonlinear*** optical properties
Solvatochromism

(linear and second order ***nonlinear*** optical properties of
biindantrione deriv. ***photochromic*** material in polymer hosts)
IT 56-23-5, Carbon tetrachloride, uses 67-66-3, Chloroform, uses 67-68-5,
DMSO, uses 71-43-2, Benzene, uses 75-05-8, Acetonitrile, uses
75-09-2, uses 108-88-3, Toluene, uses 110-82-7, Cyclohexane, uses
123-91-1, Dioxane, uses 9011-14-7, PMMA 25067-59-8, Poly(
vinylcarbazole)

RL: NUU (Other use, unclassified); USES (Uses)
(linear and second order ***nonlinear*** optical properties of
biindantrione deriv. ***photochromic*** material in polymer hosts)

IT 197023-27-1P 197023-28-2P
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP
(Preparation); RACT (Reactant or reagent)
(linear and second order ***nonlinear*** optical properties of
biindantrione deriv. ***photochromic*** material in polymer hosts)

IT 1707-95-5, Bindon 6203-18-5, p-(Dimethylamino)cinnamic aldehyde
RL: RCT (Reactant); RACT (Reactant or reagent)
(linear and second order ***nonlinear*** optical properties of
biindantrione deriv. ***photochromic*** material in polymer hosts)

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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L5 ANSWER 16 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

AN 1997:579455 CAPLUS

DN 127:270409

ED Entered STN: 11 Sep 1997

TI ***Carbazole*** -based multifunctional molecules for photorefractive applications

AU Wang, Qing; Gharavi, Alireza; Li, Wenjie; Yu, Luping

CS Department of Chemistry and James Frank Institute, The University of Chicago, Chicago, IL, 60637, USA

SO Polymer Preprints (American Chemical Society, Division of Polymer

Chemistry) (1997), 38(2), 516-517

CODEN: ACPPAY; ISSN: 0032-3934

PB American Chemical Society, Division of Polymer Chemistry

DT Journal

LA English

CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

AB A multifunctional ***photochromic*** mols. consist of a ***carbazole*** part with a ***nonlinear*** optical chromophore unit attached via an alkyl link to the N atom of the ***carbazole*** unit. These compds. exhibit dual functions: photocond. and a second order ***nonlinear*** optical activity. The photocharge transport and the electrooptic functions are performed by two sep. constituents.

Photorefractive effect of ethyl(hexylsulfonylphenylazophenyl)aminododecyl carbazole (I) was studied along with dynamic holog. recording in a film contg. I and 0.9% of 2,4,7-trinitro-9-fluorenone.

ST photorefractive ***carbazole*** based multifunctional mol holog; ***nonlinear*** optical substituent ***carbazole*** deriv

IT photorefractive

Holography

Photorefractive effect

Photorefractive materials

(photorefractive effect and dynamic holog. recording using ***carbazole*** -based multifunctional mols.)

IT ***Nonlinear*** optical properties
(two beam-coupling; of photorefractive ***carbazole*** -based multifunctional mols.)

IT 196201-41-9

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(photorefractive effect and dynamic holog. recording using ***carbazole*** -based multifunctional mols.)

IT 129-79-3, 2,4,7-Trinitro-9-fluorenone

RL: TEM (Technical or engineered material use); USES (Uses)

(photorefractive effect and dynamic holog. recording using ***carbazole*** -based multifunctional mols.)

L5 ANSWER 17 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

AN 1997:501363 CAPLUS

DN 127:211660

ED Entered STN: 08 Aug 1997

TI Transient absorption spectroscopy of semiconductor nanoclusters

AU Kamat, Prashant V.

CS Radiation Lab., Univ. Notre Dame, Notre Dame, IN, 46556, USA

SO Reza Kenkyu (1997), 25(6), 417-424

CODEN: REKEDA; ISSN: 0387-0200

PB Reza Gakkai

DT Journal; General Review

LA English

CC 73-0 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 52, 66, 72, 76

AB A review with 152 refs. Transient absorption spectroscopy is convenient to probe the photophys. and photochem. effects of semiconductor nanoclusters and heterogeneous charge transfer events at the semiconductor interface. The fast kinetic spectroscopy not only enables the detection of photogenerated transients in the femtosecond to microsecond time domain, but also enables understanding of the photophys. and photochem. properties that are unique to semiconductor nanoclusters. For example, this technique provided some useful kinetic and mechanistic information of size quantization effects, ***nonlinear*** optical effects, electro and ***photochromic*** effects, photocurrent ***generation***, photocatalysis and ***charge*** rectification properties of semiconductor nanoclusters. These properties are controlled by charge sepn., charge trapping and heterogeneous charge transfer at the semiconductor interface under UV and visible light irradn. Some recent developments in this area are presented.

ST transient absorption spectroscopy semiconductor nanocluster review; optical transient absorption semiconductor nanocluster review; laser

IT transient absorption semiconductor nanocluster review

(UV and visible; transient absorption spectroscopy of semiconductor

IT nanoclusters)
IT UV and visible spectra
(absorption; transient absorption spectroscopy of semiconductor
nanoclusters)
IT Electron transfer
(from excited dye mols. to semiconductor nanoclusters)
IT Clusters
(nano-; transient absorption spectroscopy of semiconductor
nanoclusters)
IT Catalysts
(photochem.; transient absorption spectroscopy of semiconductor
nanoclusters)
IT Nanoparticles
Nonlinear optical properties
Quantum size effect
Semiconductor materials
(transient absorption spectroscopy of semiconductor nanoclusters)
IT Optical absorption
(transient; transient absorption spectroscopy of semiconductor
nanoclusters)

L5 ANSWER 18 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1996:703842 CAPLUS
DN 126:8885
ED Entered STN: 27 Nov 1996
TI Multiple-grating formation in photorefractive polymers with azo-dye
chromophores.
AU Smith, M. A.; King, N. R.; Mitchell, G. R.; O'Leary, S. V.
CS J. J. Thomson Physical Laboratory, University Reading, Reading, RG6 6AF,
UK
SO Proceedings of SPIE-The International Society for Optical Engineering
(1996), 2850(Organic Photorefractive Materials and Xerographic
Photoreceptors), 14-21
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
CC 36-5 (Physical Properties of Synthetic High Polymers)
Section cross-reference(s): 73
AB Photorefractive polymers which incorporate azo-dyes as the ***non*** -
linear chromophore element, can be used not only for generating
gratings by the photorefractive effect, but also by
photoisomerization of the azo-dye. In the latter mechanism,
repeated trans-cis ***isomerization*** causes the chromophore mols. to
become aligned at right angles to the laser polarization direction,
thereby making the material birefringent. These two phenomena are to a
large degree independent, and can be studied sep., by appropriate choice
of polarization direction of the interacting beams. Furthermore, the
diffraction efficiency of the photorefractive gratings is a very sensitive
function of the poling field strength, while that of the
photoisomerization gratings is less so. In this work, we
investigate the components diffracted from each of these grating formed in
a hybrid photorefractive polymer material PVK:TNF:DEACST:disperse red 1.
We then explore the possibility of performing some simple optical
processing applications, exploiting the flexibility provided by this
multiple grating process. A scheme for producing a novelty filter, which
displays only the moving parts of a scene is considered. The limitations
of these films for such processing applications are discussed.
ST grating multiple photorefractive polymer; azo dye chromophore polymer
grating
IT Diffraction gratings
(multiple-grating formation in photorefractive polymers with azo-dye
chromophores)
IT Photorefractive materials
RL: PRP (Properties)
(multiple-grating formation in photorefractive polymers with azo-dye
chromophores)
IT ***Isomerization***
(***photoisomerization*** ; multiple-grating formation in
photorefractive polymers with azo-dye chromophores)
IT 2872-52-8, Disperse RED1 25067-59-8, Poly(N- ***vinylcarbazole***)
119516-33-5, 4-N,N-Diethylamino-(E)-cinnamonnitrile

RL: PRP (Properties)
(multiple-grating formation in photorefractive polymers with azo-dye chromophores)

L5 ANSWER 19 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1996:422405 CAPLUS
DN 125:71414
ED Entered STN: 18 Jul 1996
TI Photochemistry and Photophysics of Liquid Interfaces by Second Harmonic Spectroscopy
AU Eisenthal, K. B.
CS Department of Chemistry, Columbia University, New York, NY, 10027, USA
SO Journal of Physical Chemistry (1996), 100(31), 12997-13006
CODEN: JPCHAX; ISSN: 0022-3654
PB American Chemical Society
DT Journal; General Review
LA English
CC 74-0 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 66
AB The study of photochem. and photophys. processes at various liq. interfaces using second harmonic generation methods is described. Among the topics discussed are the dynamics of photoinduced structure changes, the ***transport*** of ***charge*** across an interface, the rotational motions of interfacial mols., intermol. energy transfer within the interface, interfacial photopolymn., and photoprocesses at a semiconductor/liq. interface. A review with 107 refs.
ST review photochemistry photophysics liq interface; second harmonic spectroscopy liq interface review
IT Energy transfer
Interface
Photochemistry
(photochem. and photophysics of liq. interfaces by second harmonic spectroscopy)
IT Electron exchange and Charge transfer
Isomerization
Polymerization
(photochem., photochem. and photophysics of liq. interfaces by second harmonic spectroscopy)
IT Optical ***nonlinear*** property
(second-harmonic generation, photochem. and photophysics of liq. interfaces by second harmonic spectroscopy)

L5 ANSWER 20 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1995:859398 CAPLUS
DN 123:269408
ED Entered STN: 17 Oct 1995
TI ***Nonlinear*** optical properties of organic MIS structures
AU Charra, Fabrice
CS DEIN-SPE, Centre d'Etudes de Saclay, Gif-sur-Yvette, F-91 191, Fr.
SO MCLC S&T, Section B: Nonlinear Optics (1995), 10(1-4), 287-94
CODEN: MCLOEB; ISSN: 1058-7268
PB Gordon & Breach
DT Journal; General Review
LA English
CC 73-0 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
AB An important particularity of org. semiconductors is their strong coupling between ***charge*** - ***transport*** and optical properties. By applying a voltage on a Metal-Insulator-Semiconductor (MIS) structure charges can be injected in the semiconductor under well-controlled conditions. Based on these principles, new mechanisms of electrooptic coupling and all-optical coupling (i.e., ***nonlinear*** optical) phenomena appear in org. MIS devices. The use of these properties for the characterization of ***charge*** - ***transport*** and for light-modulating devices are discussed. The example of the assocn. in a MIS structure of electrooptic coupling and photo-cond. is discussed. It leads to a new type of elec.-controlled ***photochromic*** device. A review with 16 refs.
ST ***nonlinear*** optical property org MIS review
IT Electrooptical effect
Optical ***nonlinear*** property

(***nonlinear*** optical properties and electrooptical effect of org. MIS structures)

IT Optical instruments
(modulators, ***nonlinear*** optical properties and electrooptical effect of org. MIS structures used in modulators)

L5 ANSWER 21 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

AN 1995:228102 CAPLUS

DN 122:200855

ED Entered STN: 06 Dec 1994

TI Novel second harmonic ***generation*** from intermolecular ***charge*** -transfer complexes of styrylpyridinium salts in the crystalline state

AU Sakaguchi, Hiroshi; Nagamura, Toshihiko; Kodama, Masahiro; Nishiyama, Nobuaki; Sakashita, Hiroyuki; Matsuo, Taku

CS Crystalline Films Lab., Shizuoka Univ., Hamamatsu, 432, Japan

SO Molecular Crystals and Liquid Crystals Science and Technology, Section A: Molecular Crystals and Liquid Crystals (1994), 255, 121-9
CODEN: MCLCE9; ISSN: 1058-725X

PB Gordon & Breach

DT Journal

LA English

CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 73

AB Novel second harmonic generation (SHG) was obsd. from the cryst. powder of the ion-pair charge-transfer (CT) complexes consisting of 1-methyl-4-(4-nitrostyryl)pyridinium as an acceptor and tetraphenylborate as a donor. The second harmonic light intensity dramatically decreased upon excitation of a CT band due to the photoinduced electron transfer from tetraphenylborate to styrylpyridinium moiety. These results strongly suggested that the CT transition in the ion-pair complexes would cause SHG. The cryst. structure of an ion-pair CT complex of 1-methyl-4-(4-cyanostyryl)pyridinium tetraphenylborate which also exhibited strong SHG was investigated to elucidate the mechanism of the SHG in the ion-pair CT complex system.

ST styrylpyridinium salt charge transfer complex photophys; second harmonic generation styrylpyridinium ion pair; ***nonlinear*** optical property styrylpyridinium salt; photochem control second harmonic generation

IT ***Photochromism***
(of intermol. charge-transfer complexes of styrylpyridinium salts in cryst. state)

IT Crystal structure
(of ion-pair charge-transfer complex of methyl(cyanostyryl)pyridinium tetraphenylborate)

IT Electron exchange and Charge transfer
(photochem., novel second harmonic ***generation*** from intermol.
charge -transfer complexes of styrylpyridinium salts in cryst. state)

IT Optical ***nonlinear*** property
(second-harmonic generation, novel second harmonic ***generation*** from intermol. ***charge*** -transfer complexes of styrylpyridinium salts in cryst. state)

IT 161859-28-5, 1-Methyl-4-(4-cyanostyryl)pyridinium tetraphenylborate
RL: PEP (Physical, engineering or chemical process); PRP (Properties);
PROC (Process)
(novel second harmonic generation and crystal structure of)

IT 140651-15-6, 1-Methyl-4-(4-nitrostyryl)pyridinium tetraphenylborate
RL: PEP (Physical, engineering or chemical process); PRP (Properties);
PROC (Process)
(novel second harmonic ***generation*** from intermol.
charge -transfer complexes of styrylpyridinium salts in cryst. state)

IT 140651-16-7, 1-Methyl-4-(4-nitrostyryl)pyridinium methylbenzenesulfonate
140651-17-8, 1-Methyl-4-(4-nitrostyryl)pyridinium perchlorate
RL: PEP (Physical, engineering or chemical process); PRP (Properties);
PROC (Process)
(novel second harmonic ***generation*** from intermol.
charge -transfer complexes of styrylpyridinium salts in cryst. state in relation to)

AN 1994:165686 CAPLUS
DN 120:165686
ED Entered STN: 02 Apr 1994
TI Electric field dependence of the laser induced holographic grating relaxation of photorefractive polymer
AU Wang, C. H.; Ma, R. J.; Zhang, X. Q.; Ducharme, S.; Takacs, J. M.
CS Univ. Nebraska, Lincoln, NE, USA
SO Report (1992), Order No. AD-A252641, 10 pp. Avail.: NTIS
From: Gov. Rep. Announce. Index (U. S.) 1992, 92(20), Abstr. No. 256,369
DT Report
LA English
CC 37-5 (Plastics Manufacture and Processing)
AB Laser-induced holog. grating relaxation (HGR) electrooptical (EO) and second harmonic generation (SHG) studies were carried out in a guest/host system subjected to an external elec. field with and without the presence of a ***hole*** ***transport*** agent. The guest was NNI, which has a moderate second-order ***nonlinear*** optical coeff., the host was PMMA, and the ***hole*** ***transport*** agent was DEH. In the presence of DEH, the lifetime of the cis ***isomer*** of NNI detected by using the HGR technique is lengthened by the application of an elec. field of moderate strength. The field dependence effect is not obsd. when DEH is absent in the sample. The result is interpreted as due to the stabilization of the cis ***isomer*** by the elec. field polarized DEH. The data obtained from SHG and EO measurements appear to corroborate the HGR result.
ST elec field holog grating relaxation; photorefractive PMMA grating relaxation laser
IT Holography
(diffraction gratings, photorefractive PMMA, laser induced relaxation of, elec. field effect on)
IT Diffraction gratings
(holog., photorefractive PMMA, laser induced relaxation of, elec. field effect on)
IT Optical materials
(***nonlinear*** , composite with PMMA, holog. gratings, laser induced relaxation of, elec. field effect on)
IT 9011-14-7, PMMA
RL: PRP (Properties)
(contg. ***nonlinear*** optical compd. and ***hole*** ***transport*** agent, elec. field effect on laser-induced holog. grating relaxation of)

L5 ANSWER 23 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1993:243976 CAPLUS
DN 118:243976
ED Entered STN: 12 Jun 1993
TI The electric field dependence of the laser induced holographic grating relaxation of a photorefractive polymer
AU Wang, C. H.; Ma, R. J.; Zhang, X. Q.; Ducharme, Stephen; Takacs, J. M.
CS Dep. Chem., Univ. Nebraska, Lincoln, NE, 68588-0304, USA
SO Proceedings of SPIE-The International Society for Optical Engineering (1993), 1775(Nonlinear Optical Properties of Organic Materials V), 262-70
CODEN: PSISDG; ISSN: 0277-786X
DT Journal
LA English
CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
AB Laser induced holog. grating relaxation (HGR), electro-optical (EO) and second harmonic generation (SHG) studies were carried out in a guest/host system subject to an external elec. field with and without the presence of a ***hole*** ***transport*** agent. The guest is 1-(4-nitrophenylazo) 2-naphthyl isobutyrate (NNI), which has moderate second order ***nonlinear*** optical (***NLO***) coeff., the host is PMMA and the ***hole*** ***transport*** agent is p-diethylaminobenzaldehyde diphenylhydrazone (DEH). In the presence of DEH, the lifetime of the cis ***isomer*** of NNI detected by using the HGR technique is lengthened by the application of an elec. field of moderate strength. The field dependence effect is not obsd. when DEH is absent in the sample. The result is interpreted as due to the stabilization of the cis- ***isomer*** by the elec. field polarized DEH. The data obtained from SHG and EO measurements appear to corroborate the HGR result.

ST laser holog grating relaxation photorefractive polymer; elec field dependence holog grating relaxation
IT Holography (grating relaxation of photorefractive polymer, elec. field dependence of laser-induced)
IT Polymers, properties
RL: PRP (Properties) (holog. grating relaxation of photorefractive, elec. field dependence of laser-induced)
IT Electrooptical effect
Optical ***nonlinear*** property (of photorefractive polymer, elec. field dependence of laser-induced holog. grating relaxation in relation to)
IT Laser radiation (second harmonic generation of, of photorefractive polymer, elec. field dependence of laser-induced holog. grating relaxation in relation to)
IT Holography (diffraction gratings, relaxation of photorefractive polymer, elec. field dependence of laser-induced)
IT Diffraction gratings (holog., relaxation of photorefractive polymer, elec. field dependence of laser-induced)
IT 9011-14-7, Poly(methyl methacrylate)
RL: USES (Uses) (holog. grating relaxation of doped photorefractive, elec. field dependence of laser-induced)
IT 147598-52-5
RL: USES (Uses) (holog. grating relaxation of photorefractive polymer doped with, elec. field dependence of laser-induced)
IT 68189-23-1, p-Diethylaminobenzaldehyde diphenylhydrazone
RL: USES (Uses) (holog. grating relaxation of photorefractive polymer in presence of, elec. field dependence of laser-induced)

L5 ANSWER 24 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1992:215488 CAPLUS
DN 116:215488
ED Entered STN: 31 May 1992
TI Photoreflectivity in doped ***nonlinear*** organic polymers
AU Moerner, W. E.; Walsh, C.; Scott, J. C.; Ducharme, S.; Burland, D. M.; Bjorklund, G. C.; Twieg, R. J.
CS Almaden Res. Cent., IBM, San Jose, CA, 95120-6099, USA
SO Proceedings of SPIE-The International Society for Optical Engineering (1991), 1560(Nonlinear Opt. Prop. Org. Mater. 4), 278-89
CODEN: PSISDG; ISSN: 0277-786X
DT Journal
LA English
CC 37-5 (Plastics Manufacture and Processing)
Section cross-reference(s): 38, 73
AB The properties of a new class of materials exhibiting the photorefractive effect, doped optical ***nonlinear*** org. polymers, are described. Photorefraction (at 647.1 nm) is established by a combination of hologram erasability, correlation with photocond. and electrooptic response, and enhancement by external fields in numerous samples (178-533 .mu.m thick) of 2 ***nonlinear*** epoxy materials doped with ***hole*** ***transport*** agents based on p-(diethylamino)benzaldehyde diphenylhydrazone. Diffraction efficiencies ltoreq. 0.1% are obsd. at bias fields near 100 kV/cm. A useful property of these materials is that poling of the ***nonlinear*** chromophores is partially reversible, permitting partial control of the grating readout independent of the space-charge field formed. The polarization anisotropy of grating readout is consistent with the photorefractive mechanism. Two-beam coupling measurements of both absorption and index gratings show (a) the absorption gratings are .simeq. 10 times smaller than the index gratings, and (b) the phase shift of the index grating is near 90.degree., which cannot occur via ***photochromism***, heating, or any other process except photorefractivity.
ST photoreflectivity doped ***nonlinear*** epoxy resin; ***hole*** ***transport*** agent epoxy photorefractivity
IT Electrooptical effect (of epoxy resins contg. ***hole*** ***transport*** agents,

photorefractivity in relation to)
IT Epoxy resins, properties
RL: PRP (Properties)
(photorefractivity of ***nonlinear*** optical, doped with
hole ***transport*** agents)
IT Optical materials
(***nonlinear*** , epoxy resins doped with ***hole***
transport agents, photorefractivity of)
IT 68189-23-1 83890-47-5
RL: PRP (Properties)
(***hole*** ***transport*** agents, ***nonlinear*** optical
epoxy resins doped with, photorefractivity of)
IT 125061-60-1 128611-17-6
RL: PRP (Properties)
(photorefractivity of ***nonlinear*** optical, doped with
hole ***transport*** agents)

L5 ANSWER 25 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

AN 1992:193573 CAPLUS

DN 116:193573

ED Entered STN: 16 May 1992

TI Novel second harmonic ***generation*** from intermolecular
charge -transfer complexes of styrylpyridinium tetraphenylborate

AU Sakaguchi, Hiroshi; Nagamura, Toshihiko; Matsuo, Taku

CS Res. Inst. Electron., Shizuoka Univ., Hamamatsu, 432, Japan

SO Journal of the Chemical Society, Chemical Communications (1992), (3),
209-10

CODEN: JCCCAT; ISSN: 0022-4936

DT Journal

LA English

CC 22-9 (Physical Organic Chemistry)

AB Strong second harmonic light was obsd. for the first time from intermol.
ion-pair charge-transfer complexes of nitrostyrylpyridinium
tetraphenylborate, the intensity of which decreased on irradn. at
wavelengths longer than 370 nm to induce charge sepn.

ST second harmonic generation styrylpyridinium; charge transfer complex
second harmonic generation

IT Electron exchange and Charge transfer

(in salts of styrylpyridinium, second harmonic generation in relation
to)

IT ***Photochromism***

(of methyl(nitrostyryl)pyridinium tetraphenylborate)

IT Optical ***nonlinear*** property

(harmonic ***generation***, second, from ***charge*** -transfer
complexes of styrylpyridinium)

IT Electron exchange and Charge transfer

(photochem., in methyl(nitrostyryl)pyridinium tetraphenylborate)

IT 140651-15-6 140651-16-7 140651-17-8

RL: PRP (Properties)

(ion-pair charge-transfer complex, second harmonic generation from)

L5 ANSWER 26 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN

AN 1990:580415 CAPLUS

DN 113:180415

ED Entered STN: 09 Nov 1990

TI Non-equilibrium charge transfer and low-temperature photorefractive
effects

AU Nolte, David D.; Glass, Alastair M.

CS AT and T Bell Lab., Murray Hill, NJ, 07974, USA

SO Optical and Quantum Electronics (1990), 22(Spec. Issue), S47-S60

CODEN: OQELDI; ISSN: 0306-8919

DT Journal

LA English

CC 73-2 (Optical, Electron, and Mass Spectroscopy and Other Related
Properties)

AB Defects and ***charge*** / ***transport*** play crit. roles in the
photorefractive behavior of electrooptic materials. Thus the
photorefractive effect can be used as a noninvasive optical probe at the
electronic properties of these materials. Low temp. photorefractive
spectroscopy has revealed new insight into carrier trapping and deep level
defects in semiinsulating InP and GaAs.

ST nonequil charge transfer gallium arsenide; photorefractive effect indium

phosphide
IT Optical diffraction
· (for iron-doped indium phosphide)
IT Crystal defects
· (in electrooptical materials, photorefractive study of)
IT Electron exchange
· (nonequil., in semiinsulating gallium arsenide and indium phosphide)
IT ***Photochromism***
· (of chromium-doped gallium arsenide)
IT Trapping and Traps
· (of current carriers in semiinsulating gallium arsenide and indium phosphide)
IT Optical materials
· (electro-, photorefractive behavior in)
IT Optical ***nonlinear*** property
· (four-wave mixing, of chromium-doped gallium arsenide)
IT Electric current carriers
· (nonequil., in electrooptical materials)
IT 1303-00-0, Gallium arsenide, properties
RL: PRP (Properties)
· (nonequil. charge transfer and low temp. photorefractive effects in chromium-contg.)
IT 7439-89-6, Iron, properties
RL: PRP (Properties)
· (nonequil. charge transfer and low temp. photorefractive effects in indium phosphide contg.)
IT 22398-80-7, Indium phosphide, properties
RL: PRP (Properties)
· (nonequil. charge transfer in low temp. photorefractive effects in iron-contg.)
IT 7440-47-3, Chromium, properties
RL: PRP (Properties)
· (***nonlinear*** charge transfer and low temp. photorefractive effects in gallium arsenide contg.)

L5 ANSWER 27 OF 27 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1967:453488 CAPLUS
DN 67:53488
ED Entered STN: 12 May 1984
TI Configuration of vinyl radicals. The generation and trapping of each member of a configurationally ***isomeric*** pair of vinyl radicals
AU Sargent, G. Dann; Browne, M. Warren
CS Amherst Coll., Amherst, MA, USA
SO Journal of the American Chemical Society (1967), 89(11), 2788-90
CODEN: JACSAT; ISSN: 0002-7863
DT Journal
LA English
CC 22 (Physical Organic Chemistry)
AB ***Isomeric*** vinyl free radicals were generated by treating Na naphthalenide with cis- and trans-3-chloro-3-hexene at 0.degree. and 27.degree. using tetrahydrofuran and 1,2-dimethylethane as solvents. The only detectable products were cis- and trans-3-hexene in 98% yield with the trans ***isomer*** predominating. Since these results excluded the possibility of a single linear sp radical or 2 ***isomeric*** configurationally stable, ***nonlinear*** sp₂ vinyl free radicals, it was concluded that the initial ***charge*** -transfer reaction ***generates*** a ***nonlinear*** vinyl radical which is capable of facile inversion at the radical site, but the radical is trapped before complete equilibration with its configurational ***isomer*** is achieved. A mechanism by which the interconverting free radical can be trapped is postulated.
ST CONFIGURATION VINYL RADICALS; RADICALS VINYL CONFIGURATION; VINYL RADICALS CONFIGURATION
IT Stereochemistry
· (of naphthylsodium reaction with (E)- and (Z)-3-chloro-3-hexenes)
IT 3481-12-7
RL: PRP (Properties)
· (reaction with 3-chloro-3-hexenes, stereochemistry of)
IT 17226-34-5 17226-35-6
RL: PRP (Properties)
· (reaction with naphthylsodium, stereochemistry of)
IT 17326-77-1 17440-31-2

RL: PRP (Properties)
(stereochemistry of)

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L1 197907 S (NLO OR NONLINEAR OR (NON(3A)LINEAR) OR HYPERPOLARIZ?)
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L3 1293 S L1 AND L2
L4 369617 S (PHOTOCHROM? OR DIARYLETHANE OR DIHETEROARYLETHANE OR SPIROPY
L5 27 S L3 AND L4

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NEWS 7 SEP 09 ACD predicted properties enhanced in REGISTRY/ZREGISTRY
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to core patent offices
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visualization tools
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NEWS 15 OCT 27 EPFULL enhanced with additional content

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AND CURRENT DISCOVER FILE IS DATED 13 JUNE 2005

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=> s (diarylethene or perfluorocyclopentene)
498 DIARYLETHENE
262 DIARYLETHENES
594 DIARYLETHENE
(DIARYLETHENE OR DIARYLETHENES)
351 PERFLUOROCYCLOPENTENE
29 PERFLUOROCYCLOPENTENES
361 PERFLUOROCYCLOPENTENE
(PERFLUOROCYCLOPENTENE OR PERFLUOROCYCLOPENTENES)
L1 828 (DIARYLETHENE OR PERFLUOROCYCLOPENTENE)

=> s l1 and (nlo or nonlinear or hyperpolariz? or non(2a)linear)

5079 NLO
8 NLOS
5082 NLO
(NLO OR NLOS)
163729 NONLINEAR
2 NONLINEARS
163731 NONLINEAR
(NONLINEAR OR NONLINEARS)
19775 HYPERPOLARIZ?
755839 NON
34 NONS
755866 NON
(NON OR NONS)
556631 LINEAR
55 LINEARS
556655 LINEAR
(LINEAR OR LINEARS)
20191 NON(2A)LINEAR
L2 14 L1 AND (NLO OR NONLINEAR OR HYPERPOLARIZ? OR NON(2A)LINEAR)

=> d all 1-14

L2 ANSWER 1 OF 14 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2005:1076322 CAPLUS
ED Entered STN: 07 Oct 2005
TI Molecular orientation by two-photon absorption
AU Ishitobi, H.; Maeda, M.; Sekkat, Z.; Kawata, S.
CS Osaka Univ., Japan
SO Proceedings of SPIE-The International Society for Optical Engineering (2005), 5935(Linear and Nonlinear Optics of Organic Materials V), 125-132
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
CC 73 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
AB We demonstrate that two-photon induced mol. orientation of ***diarylethene*** (DE) in thin films of poly-methyl-methacrylate (PMMA) and multi-photon induced anisotropic bleaching of disperse red one (DR1). We confirmed that two-photon absorption was induced in DE by measuring the quadratic dependence of isomerization rate on excitation light power, and we obsd. two-photon photo-orientation of DE in dichroic absorbance. Disperse red one (DR1) was orientationally bleached in PMMA by polarized multi-photon excitation. Anisotropic refractive index changes result from

the ***nonlinear*** photobleaching of DR1 was detected by a polarization confocal microscope, and bit-oriented data storage was demonstrated.

L2 ANSWER 2 OF 14 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2005:1076285 CAPLUS
ED Entered STN: 07 Oct 2005
TI Photoreactive third-harmonic generation via either one- or two-photon excitation in ***diarylethene*** -polymethylmethacrylate polymer thin films: theory and experiment
AU Lin, Jian Hung; Lai, Ngoc Diep; Wang, Wei Lin; Hsu, Chia Chen
CS National Chung Cheng Univ., Taiwan
SO Proceedings of SPIE-The International Society for Optical Engineering (2005), 5935(Linear and Nonlinear Optics of Organic Materials V), 262-272
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
CC 73 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
AB Photoreactive third-harmonic (TH) generation at 355 nm in ***diarylethene*** - polymethylmethacrylate (DE-PMMA) polymer thin films is obtained by either one- or two-photon excitation. TH intensity generated from a DE-PMMA polymer thin film decreases, when it is pumped by either 325 nm or 442 nm, which change mol. structure of DE mols. from open-form (A form) to closed-form (B form). TH intensity recovers to its original intensity level, after all B form DE mols. return to A form induced by 532 nm or 1064 nm laser irradn. The exptl. results reveal that the second-order ***hyperpolarizability*** (.gamma.) of A form mols. may be larger than that of B form mols. Moreover, TH output efficiency is independent of the angle between the pump and probe polarization directions. Those exptl. results were explained by using a photoinduced isomerization theory based angular hole burning and angular redistribution mechanisms for two-dimensional structure of DE mols. including the two-photon absorption effect of B form. The simulation results are consistent with those of optical pumping TH expt.

L2 ANSWER 3 OF 14 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2005:297329 CAPLUS
ED Entered STN: 07 Apr 2005
TI Optical manipulation of third-harmonic generation via either one- or two-photon excitation in ***diarylethene*** -polymethylmethacrylate polymer thin films
AU Lai, N. D.; Wang, W. L.; Lin, J. H.; Hsu, C. C.
CS Department of Physics, National Chung Cheng University, Ming Hsiung, Taichung, Taiwan
SO Applied Physics B: Lasers and Optics (2005), 80(4-5), 569-572
CODEN: APBOEM; ISSN: 0946-2171
PB Springer GmbH
DT Journal
LA English
CC 73 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
AB Optical manipulation of third harmonic (TH) generation in ***diarylethene*** -polymethylmethacrylate (DE-PMMA) polymer thin films is obtained by either one- or two-photon excitation. TH intensity generated from a DE-PMMA polymer thin film decreases, when it is pumped by either 325 nm or 442 nm laser irradn., which changes the mol. structure of DE mols. from an open-form (A form) to a closed-form (B form). TH intensity recovers to its original intensity level when all B form DE mols. return to an A form after being induced by either 532 nm or 1064 nm laser irradn. The exptl. results reveal that the second-order ***hyperpolarizability*** (.gamma.) of the A form mols. may be larger than that of the B form mols. Moreover, TH output efficiency is independent of the angle between the pump and probe polarization directions. This result is attributed to the two-dimensional structure of DE mols.

RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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- (2) Delaire, J; Mol Cryst and Liq Cryst 2000, V345, P233 CAPLUS
- (3) Hoshino, M; J PhotoChem PhotoBiol A: Chem 1997, V105, P75 CAPLUS
- (4) Irie, M; Chem Rev 2000, V100, P1685 CAPLUS
- (5) Irie, M; J Org Chem 1988, V53, P803 CAPLUS

- (6) Irie, M; Science 2001, V291, P1769 CAPLUS
- (7) Ishitobi, H; Chem Phys Lett 1999, V300, P421 CAPLUS
- (8) Ishitobi, H; J Am Chem Soc 2000, V122, P12802 CAPLUS
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- (13) Sekkat, Z; Photoreactive Organic Thin Films 2002
- (14) Sekkat, Z; Synth Met 1993, V54, P373 CAPLUS
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- (16) Toriumi, A; Opt Lett 1998, V23, P1924

L2 ANSWER 4 OF 14 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2005:122207 CAPLUS
ED Entered STN: 11 Feb 2005
TI Investigation of novel two-photon ***diarylethene*** for 3D optical data storage
AU Zhang, Fushi; Xu, Fengying; Sun, Fan; Zhao, Funqun; Liu, Xuedong; Huang, Wenhao
CS Key lab of Organic Optoelectronics & Molecular Engineering of Ministry of Education, Department of Chemistry, Tsinghua Univ., Beijing, 100084, Peop. Rep. China
SO Proceedings of SPIE-The International Society for Optical Engineering (2005), 5643(Advances in Optical Data Storage Technology), 1-4
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
CC 74 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
AB 3D optical data storage can benefit from the ***non*** - ***linear*** process of two-photon absorption (TPA). If some chromophores with large TPA cross section are introduced into the ***diarylethene*** to enhance its two-photon absorptivities, it is expected to be good recording media for 3D optical data storage. The authors have synthesized four diarylperfluorocyclopentene (DPFCP) derivates for the purpose of developing two-photon 3D optical data storage. The ***nonlinear*** two-photon absorption (TPA) properties of the compds. were examd., and the reaction and excited state relaxation dynamics after two-photon excitation were investigated. The TPA cross sections of 2-position DPFCPs were measured by means of TPIF (two-photon induced fluorescence) method, and the highest is 48.times.10-50cm⁴.cntdot.s.cntdot.photo-1.cntdot.mol.-1. The compds. were successfully applied in two-photon 3D optical data storage based on single beam two-photon femtosecond writing and one-photon fluorescence reading. Ten-layer clear images on DPFCP/PMMA film were obtained, and the data storage d. is high to 2.0.times.10¹¹ bits/cm³.

RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Day, D; Applied Optics 1998, V37, P6299 CAPLUS
- (2) Day, D; Opt Lett 1999, V24, P948 CAPLUS
- (3) Dvornikov, A; SPIE 1999, V3802, P192 CAPLUS
- (4) Hunter, S; Applied Optics 1990, V29, P2058
- (5) Mukherjee, N; Appl Phys Lett 1997, V70(12), P1524 CAPLUS
- (6) Oulianov, D; Optics Communications 2001, V191, P235 CAPLUS

L2 ANSWER 5 OF 14 CAPLUS COPYRIGHT 2005 ACS on STN

AN 2004:508008 CAPLUS

DN 141:61849

ED Entered STN: 24 Jun 2004

TI Compact light-controlled optical waveguide modulator devices and their operation

IN Fukutome, Masato

PA Kyocera Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM G02F001-313

ICS C09K009-02; G02F001-361; G02F001-365; G03C001-73

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

FAN.CNT 1

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------------|------|----------|-----------------|----------|
| PI JP'2004177623 | A2 | 20040624 | JP 2002-343009 | 20021126 |
| PRAI JP 2002-343009 | | | 20021126 | |

CLASS

| PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|---------------|--|--|
| JP 2004177623 | ICM | G02F001-313 |
| | ICS | C09K009-02; G02F001-361; G02F001-365; G03C001-73 |
| JP 2004177623 | FTERM | 2H123/AA00; 2H123/AA10; 2K002/AB09; 2K002/AB12;
2K002/BA01; 2K002/CA05; 2K002/DA06; 2K002/DA08;
2K002/GA07; 2K002/HA16; 2K002/HA20 |
| AB | The devices consist of substrates, optical modulators, and optical waveguides for light irradn. on the optical modulators. | |
| ST | optical waveguide modulator light irradn control PMMA; ***nonlinear*** optical material PMMA dye modulator; ***diarylethene*** photochromic photoresponse org glass modulator | |
| IT | ***Nonlinear*** optical materials
Optical modulators
Optical waveguides
(compact light-controlled optical waveguide modulator devices and their operation) | |
| IT | Photochromic materials
(***diarylethene*** -based; compact light-controlled optical waveguide modulator devices and their operation) | |
| IT | Organic glasses
RL: DEV (Device component use); USES (Uses)
(photoresponse; compact light-controlled optical waveguide modulator devices and their operation) | |
| IT | 9011-14-7, Poly(methyl methacrylate)
RL: DEV (Device component use); USES (Uses)
(compact light-controlled optical waveguide modulator devices and their operation) | |
| IT | 7782-41-4, Fluorine, uses
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(dopant; compact light-controlled optical waveguide modulator devices and their operation) | |
| IT | 9011-14-7D, Poly(methyl methacrylate), reaction products with dyes
RL: DEV (Device component use); USES (Uses)
(***nonlinear*** optical material; compact light-controlled optical waveguide modulator devices and their operation) | |
| L2 | ANSWER 6 OF 14 CAPLUS COPYRIGHT 2005 ACS on STN | |
| AN | 2003:686974 CAPLUS | |
| DN | 139:371499 | |
| ED | Entered STN: 03 Sep 2003 | |
| TI | Reversible switching of molecular ***nonlinear*** optical properties of photochromic ***diarylethene*** systems | |
| AU | Bertarelli, C.; Gallazzi, M. C.; Lucotti, A.; Zerbi, G. | |
| CS | Dipartimento di Chimica, Materiali e Ingegneria Chimica "G. Natta", Politecnico di Milano, Milan, 20133, Italy | |
| SO | Synthetic Metals (2003), 139(3), 933-935
CODEN: SYMEDZ; ISSN: 0379-6779 | |
| PB | Elsevier Science B.V. | |
| DT | Journal | |
| LA | English | |
| CC | 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties) | |
| AB | The vibrational contribution to the 3rd-order mol.
hyperpolarizability, .gamma.v, of dithienylethenes in the two isomeric forms were measured, revealing that a large change in ***nonlinear*** optical (***NLO***) response accompanies the photochromic process, thus opening a window on the possibility of application of such systems as switching ***NLO*** materials. The variation of .gamma.v which accompanies the photochromic process is strongly dependent on the mol. design and the electronic effect of the substituents. Also, the closed form of ***diarylethene*** bearing strong electro-donor substituent in 5,5'-positions on thiophene ring exhibits large .gamma.v. | |
| ST | reversible switching ***nonlinear*** optical property
hyperpolarizability photochromism ***diarylethene*** | |

IT Third-order ***nonlinear*** optical properties
(***hyperpolarizability*** ; reversible switching of mol.
nonlinear optical properties of photochromic
diarylethene systems)
IT Molecular vibration
Nonlinear optical properties
Photochromism
Raman spectra
(reversible switching of mol. ***nonlinear*** optical properties of
photochromic ***diarylethene*** systems)
IT Optical switching
(switching; reversible switching of mol. ***nonlinear*** optical
properties of photochromic ***diarylethene*** systems)
IT Optical ***hyperpolarizability***
(third-order; reversible switching of mol. ***nonlinear*** optical
properties of photochromic ***diarylethene*** systems)
IT 156686-76-9 182003-69-6 620990-06-9
RL: PRP (Properties)
(reversible switching of mol. ***nonlinear*** optical properties of
photochromic ***diarylethene*** systems)

RE.CNT 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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CAPLUS
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and non Linear Optically Active Materials 1991, P435 CAPLUS
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1987, V1, P23 CAPLUS

L2 ANSWER 7 OF 14 CAPLUS COPYRIGHT 2005 ACS on STN

AN 2003:72901 CAPLUS

DN 138:254618

ED Entered STN: 30 Jan 2003

TI Photoswitching of intramolecular magnetic interaction using photochromic
compounds

AU Matsuda, Kenji; Irie, Masahiro

CS Graduate School of Engineering, Kyushu University, Higashi-ku, Fukuoka,
812-8581, Japan

SO Springer Series in Chemical Physics (2003), 70(Chemistry of Nanomolecular
Systems), 25-40

CODEN: SSCPDA; ISSN: 0172-6218

PB Springer-Verlag

DT Journal; General Review

LA English

CC 22-0 (Physical Organic Chemistry)

Section cross-reference(s): 77

AB A review. Recent advances in org. material chem. have helped to realize
several novel org. functional materials, including org. conductors,
magnets, and ***nonlinear*** optical materials. One of the current
frontiers in this field is mol. electronics, where a single mol. plays the
role of one component in an elec. circuit. For the realization of this
goal, highly integrated materials with multiple functions are necessary.
Photochromism is the light-induced reversible transformation of chem.
species between two isomers that have different absorption spectra. The
two isomers differ from each other not only in the absorption spectra but
also in various phys. and chem. properties. These property changes can,

in principle, be utilized to control the function of org. materials. Two org. radicals placed at the two edges of a vpi.-conjugative mol. interact magnetically through the framework via the exchange interaction J. Therefore photocontrol of the magnetism of the system is possible when the photochromic moiety is used as a backbone. In this chapter we will describe studies of the photoswitching of the intramol. magnetism by incorporating two radical moieties into a photochromic ***diarylethene*** spin coupler. Photoswitching using a ***diarylethene*** dimer, which showed similar elec.-circuit behavior, will also be discussed.

ST review photoswitching intramol magnetic interaction photochromic compd
IT Magnetism
(intramol.; photoswitching of intramol. magnetic interaction using photochromic compds.)
IT Radicals, properties
RL: PRP (Properties)
(moieties; photoswitching of intramol. magnetism by incorporating two radicals into a photochromic ***diarylethene*** spin coupler)
IT Optical switching
(photoswitching of intramol. magnetic interaction using photochromic compds.)
IT Exchange interaction
Logic circuits
Nanostructures
Photochromism
(photoswitching of intramol. magnetism by incorporating two radicals into a photochromic ***diarylethene*** spin coupler)
IT Nitroxides
RL: PRP (Properties)
(photoswitching of intramol. magnetism by incorporating two radicals into a photochromic ***diarylethene*** spin coupler)

RE.CNT 45 THERE ARE 45 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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L2 ANSWER 8 OF 14 CAPLUS COPYRIGHT 2005 ACS on STN
 AN 2002:255330 CAPLUS

DN 137:33571

ED Entered STN: 05 Apr 2002

TI Radical copolymerization behavior of a highly fluorinated cyclic olefin with vinyl ether

AU Nishida, Shozo; Nishida, Haruo; Endo, Takeshi

CS Tsukuba Research Laboratories, JSR Corporation, Tsukuba, 305-0841, Japan

SO Journal of Polymer Science, Part A: Polymer Chemistry (2002), 40(8), 1151-1156

CODEN: JPACEC; ISSN: 0887-624X

PB John Wiley & Sons, Inc.

DT Journal

LA English

CC 35-3 (Chemistry of Synthetic High Polymers)

AB The copolymer of a highly fluorinated cyclic monomer, octafluorocyclopentene (OFCPE, M1), with Et vinyl ether (EVE, M2) was investigated with a radical initiator in bulk. Despite the poor homopolymerizability of each monomer, the copolymer proceeded successfully, and the mol. wts. of the copolymers were more than 10,000. Incorporation of the OFCPE units into the copolymer led to an increase in the glass-transition point. The copolymer compn. was detd. from ¹H NMR spectra and elemental anal. data. The molar fraction of the OFCPE unit in the copolymer increased and approached but did not exceed 0.5. The monomer reactivity ratios were estd. by the Yamada-Itahashi-Otsu

nonlinear least-squares procedure as $r_1, \text{OFCPE} = -0.008 \pm 0.010$ and $r_2, \text{EVE} = 0.192 \pm 0.015$. The reactivity ratios suggest that the copolymer may proceed in an alternating manner in the case of an excess feed of OFCPE.

ST ***perfluorocyclopentene*** reactivity ratio radical polymn vinyl ether

IT Fluoropolymers, preparation

RL: SPN (Synthetic preparation); PREP (Preparation)
 (radical prepn. and glass transition temp. of)

IT Reactivity ratio in polymerization

(radical; of ***perfluorocyclopentene*** with Et vinyl ether)

IT 363593-48-0P, Ethyl vinyl ether- ***perfluorocyclopentene*** copolymer
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
 (radical prepn. and glass transition temp. of)

IT 559-40-0, Octafluorocyclopentene

RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)
 (reactivity ratio in radical polymn. with Et vinyl ether)

IT 109-92-2, Ethyl vinyl ether

RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)
 (reactivity ratio in radical polymn. with ***perfluorocyclopentene***)
)

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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L2 ANSWER 9 OF 14 CAPLUS COPYRIGHT 2005 ACS on STN

AN 2001:792858 CAPLUS

DN 136:77164

ED Entered STN: 01 Nov 2001

TI Novel photoresponsive polymer based on ***diarylethene***
AU Kawai, Tsuyoshi; Irie, Masahiro
CS Dep. Applied Chem., Fac. Eng., Kyushu Univ., Hakozaki 6-10-1, Higashi-ku,
Fukuoka, 812-8581, Japan
SO Denki Zairyo Gijutsu Zasshi (2000), 9(2), 204-207
CODEN: DZGZFE; ISSN: 0918-9890
PB Denki Zairyo Gijutsu Kondankai
DT Journal
LA English
CC 74-9 (Radiation Chemistry, Photochemistry, and Photographic and Other
Reprographic Processes)
Section cross-reference(s): 36
AB Conjugated polymer based on the bis(benzothiophen-3-yl)
perfluorocyclopentene can exhibit drastic changes of optical and
elec. properties upon photochromic reactions of the ***diarylethene***
units. A novel photoresponsive polymer based on ***diarylethene***
and dialkylfluorene was prep'd. The polymer was prep'd. by Ru-complex
catalyzed coupling reaction of the two components. The quartz glass
supported polymer film had strong absorption band at .apprx.334 nm. After
UV exposure the pale yellow film turned to violet showing new absorption
band at 560 nm, which is characteristic band for the ring-closed form of
the ***diarylethene*** sites. After the irradn. with the visible
light .lambda. >480 nm the original yellow film was recovered and the
absorption band at 560 nm disappeared. This photochromic cycle was
repeated for more than 20 cycles and no marked degrdn. was obsd. The max.
conversion of the photochromic site was .apprx.40 % in soln. and .apprx.14
% in solid film. The polymer had photoluminescence max. at .apprx.410 nm
which decreased rapidly with exposure. After .apprx.5 min., the emission
was totally quenched, at the same time only 14% of the diarylene sites was
cyclized even at the photostationary state. This remarkable ***non***
- ***linear*** phenomenon can be explained by the term of the efficient
excitation energy transfer in the polymer chain. That is, the small amt.
of the ring-closed form sites which have second absorption band at about
400 nm acts efficiently as the energy acceptor and the emission quencher.
The cond. of the polymer also changed with exposure. The cond. was about
1.2x10-12 S-cm-1 in the 35 % cyclized state photostationary state achieved
in the soln. phase, and it decreased to 5.3 x 10-13 S-cm-1 upon irradn.
with visible light. The I-V characteristics of the Al/polymer/ITO type
junction device were studied. In this device the Al electrode was evapd.
onto the polymer film on the ITO electrode. In the original state, the
I-V curve showed clear current rectification and the forward current was
obsd. when pos. bias was applied to the ITO electrode. After the UV light
irradn. the reverse biased current was found to increase. That is,
electronic state of the ring-closed form ***diarylethene*** act as the
inter-gap state in the junction characteristics at Al-polymer interface
and photochromic reaction in small amt. of the ***diarylethene***
sites seems to results in the drastic increase in the leaking reverse
direction current.
ST photochromism photocond elec cond ***diarylethene*** dialkylfluorene
photopolymer; benzothiophenylperfluorocyclopentene based polymer
photochromism photocond elec cond
IT Polymers, properties
RL: PEP (Physical, engineering or chemical process); PNU (Preparation,
unclassified); PRP (Properties); PREP (Preparation); PROC (Process)
(conjugated; photochromism and luminescence and cond. of
photoresponsive polymer based on bis(benzothiophenyl)
perfluorocyclopentene)
IT Luminescence quenching
Photoinduced energy transfer
(intramol.; photochromism and luminescence and cond. of photoresponsive
polymer based on bis(benzothiophenyl) ***perfluorocyclopentene***)
IT Ring opening
(photochem.; photochromism and luminescence and cond. of
photoresponsive polymer based on bis(benzothiophenyl)
perfluorocyclopentene)
IT Electric conductivity
Electric current-potential relationship
Electrochromic devices
Luminescence
Photochromic materials
Photochromism
Photoconductivity

(photochromism and luminescence and cond. of photoresponsive polymer based on bis(benzothiophenyl) ***perfluorocyclopentene***)

IT Cyclization

(photocyclization; photochromism and luminescence and cond. of photoresponsive polymer based on bis(benzothiophenyl) ***perfluorocyclopentene***)

IT 384340-52-7P

RL: PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation); PROC (Process) (photochromism and luminescence and cond. of photoresponsive polymer based on bis(benzothiophenyl) ***perfluorocyclopentene***)

RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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- (2) Kawai, T; Appl Phys Lett 1995, V67, P795 CAPLUS
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L2 ANSWER 10 OF 14 CAPLUS COPYRIGHT 2005 ACS on STN

AN 2000:764182 CAPLUS

DN 134:92993

ED Entered STN: 01 Nov 2000

TI ***Nonlinear*** optical properties of ***diarylethenes***

AU Delaire, J. A.; Fanton-Maltey, I.; Chauvin, J.; Nakatani, K.; Irie, M.

CS PPSM, UMR 8531 of CNRS, Ecole Normale Supérieure de Cachan, Cachan, 94235, Fr.

SO Molecular Crystals and Liquid Crystals Science and Technology, Section A: Molecular Crystals and Liquid Crystals (2000), 345, 233-238

CODEN: MCLCE9; ISSN: 1058-725X

PB Gordon & Breach Science Publishers

DT Journal

LA English

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 22

AB Products .mu..beta. of the 1st order ***hyperpolarizabilities***

.beta. of both isomers of dithienyl ethene derivs. by their ground state dipole moments .mu. were detd. exptl. by the EFISHG technique, then calcd. by a semi-empirical method. Both calcns. and measurements put into evidence a large increase in .mu..beta. in going from the open isomer (OF) to the largely .pi. conjugated closed isomer (CF). This photoinduced change in 2nd order ***NLO*** coeff. was used to modulate the Second Harmonic Generation (SHG) signal generated by a PMMA film doped with one ***diarylethene*** under alternate irradn. with UV (325 nm) and visible (514 nm) light.

ST ***nonlinear*** optical property ***diarylethene***

IT Ground state

(dipole moment for; ***nonlinear*** optical properties of ***diarylethenes***)

IT Cyclization

(effect of; ***nonlinear*** optical properties of ***diarylethenes***)

IT Dipole moment

(ground state; ***nonlinear*** optical properties of ***diarylethenes***)

IT ***Nonlinear*** optical materials

Nonlinear optical properties

Optical ***hyperpolarizability***

Second-harmonic generation

(***nonlinear*** optical properties of ***diarylethenes***)

IT 9011-14-7, PMMA

RL: NUU (Other use, unclassified); USES (Uses)

(matrix; ***nonlinear*** optical properties of ***diarylethenes***)

IT 112440-47-8 115755-82-3 168688-69-5 185202-32-8

RL: PRP (Properties)

(***nonlinear*** optical properties of ***diarylethenes***)

RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Atassi, Y; J Phys Chem 1995, V99, P16320 CAPLUS

- (2) Atassi, Y; Mol Cryst Liq Cryst 1998, V315, P11
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 CAPLUS
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L2 ANSWER 11 OF 14 CAPLUS COPYRIGHT 2005 ACS on STN

AN 1999:676500 CAPLUS

DN 132:257359

ED Entered STN: 25 Oct 1999

TI Temporal stability of azo second-order ***nonlinear*** optical chromophores linked with perfluorocyclopentenyl moiety

AU Matsui, Masaki; Muramatsu, Hiroshige; Funabiki, Kazumasa; Shibata, Katsuyoshi; Hirota, Kazuo; Hosoda, Masahiro; Tai, Kazuo

CS Department of Chemistry, Faculty of Engineering, Gifu University, Yanagido, Gifu, 501-1193, Japan

SO Shikizai Kyokaishi (1999), 72(8), 489-493

CODEN: SKYAO; ISSN: 0010-180X

PB Shikizai Kyokai

DT Journal

LA English

CC 73-2 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 36, 37

AB The temporal stability of azo second-order ***nonlinear*** optical chromophores linked with a perfluorocyclopentenyl moiety doped in polymers was examd. The retention of second-order ***nonlinear*** optical coeff. (d33) of 1,2-bis[4-[4-[N-ethyl-N-(2-hydroxyethyl)amino] phenylazo] phenylthio] ***perfluorocyclopentene*** doped in poly(Me methacrylate) after 530 h at 50.degree.C was 5 %. The retention of second-order ***nonlinear*** optical coeff. (d33) of 1,2-bis[4-(2,4-diaminophenylazo)phenylthio] ***perfluorocyclopentene*** doped in poly(Me methacrylate-co-methacrylic acid) was improved to 45wt.% by the amino formation between azo dye and polymer matrix.

ST temporal stability azo ***nonlinear*** optical chromophore; doped polymer azo ***nonlinear*** optical chromophore temporal stability

IT Azo dyes

Chromophores

Second-order ***nonlinear*** optical properties

Thermal stability

(prepn. and temporal stability of neat and polymer-doped azo second-order ***nonlinear*** optical chromophores linked with perfluorocyclopentenyl moiety)

IT ***Nonlinear*** optical materials

(second-order; prepn. and temporal stability of neat and polymer-doped azo second-order ***nonlinear*** optical chromophores linked with perfluorocyclopentenyl moiety)

IT 178401-05-3P 262858-27-5P 262858-28-6P 262858-29-7P 262858-30-0P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(chromophore; prepn. and temporal stability of neat and polymer-doped azo second-order ***nonlinear*** optical chromophores linked with perfluorocyclopentenyl moiety)

IT 9011-14-7, PMMA 25086-15-1, Methacrylic acid-methyl methacrylate copolymer

RL: PRP (Properties)

(prepn. and temporal stability of neat and polymer-doped azo second-order ***nonlinear*** optical chromophores linked with perfluorocyclopentenyl moiety)

IT 243461-38-3

RL: RCT (Reactant); RACT (Reactant or reagent)

(starting material; prepn. and temporal stability of neat and polymer-doped azo second-order ***nonlinear*** optical chromophores linked with perfluorocyclopentenyl moiety)

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Burland, D; Chem Rev 1994, V94, P31 CAPLUS

- (2) Marks, T; Angew Chem Int Ed Engl 1995, V34, P155 CAPLUS
(3) Matsui, M; to be published in J Fluorine Chem
(4) Yu, D; Macromolecules 1994, V27, P6718 CAPLUS

L2 ANSWER 12 OF 14 CAPLUS COPYRIGHT 2005 ACS on STN
AN 1999:405855 CAPLUS
DN 131:215636
ED Entered STN: 01 Jul 1999
TI Synthesis of azo chromophores containing a perfluorocyclo-alkenyl moiety and their second-order optical nonlinearity
AU Matsui, Masaki; Tsuge, Michinori; Funabiki, Kazumasa; Shibata, Katsuyoshi; Muramatsu, Hiroshige; Hirota, Kazuo; Hosoda, Masahiro; Tai, Kazuo; Shiozaki, Hisayoshi; Kim, Misa; Nakatsu, Kazumi
CS Faculty of Engineering, Department of Chemistry, Gifu University, Gifu, 501-1193, Japan
SO Journal of Fluorine Chemistry (1999), 97(1-2), 207-212
CODEN: JFLCAR; ISSN: 0022-1139
PB Elsevier Science S.A.
DT Journal
LA English
CC 41-3 (Dyes, Organic Pigments, Fluorescent Brighteners, and Photographic Sensitizers)
Section cross-reference(s): 38, 73
AB 1,2-Bis[4-[4-[N-ethyl-N-(2-hydroxyethyl)aminophenylazo]phenylthio] ***perfluorocyclopentene***, having two independent intramol. push-pull chromophores in the mol., showed a higher second-order ***nonlinear*** coeff. (d33) than its perfluorocyclobutanyl, perfluorocyclohexenyl, and nitroperfluorocyclopentenyl analogs in PMMA or polycarbonate.
ST azo dye ***nonlinear*** optical prepn
IT Bond length
(carbon-carbon; in second-order ***nonlinear*** optical azo dye)
IT Bond length
(carbon-nitrogen; in second-order ***nonlinear*** optical azo dye)
IT Bond length
(carbon-sulfur; in second-order ***nonlinear*** optical azo dye)
IT Bond angle
(in second-order ***nonlinear*** optical azo dye)
IT Crystal structure
(of second-order ***nonlinear*** optical azo dye)
IT Azo dyes
(prepn. of second-order ***nonlinear*** optical)
IT Second-order ***nonlinear*** optical properties
(prepn. of second-order ***nonlinear*** optical azo dyes)
IT Polycarbonates, uses
RL: NUU (Other use, unclassified); USES (Uses)
(second-order optical nonlinearity of azo dyes in)
IT Bond angle
(torsional; in second-order ***nonlinear*** optical azo dye)
IT 92-50-2, 2-(N-Ethylanilino)ethanol
RL: RCT (Reactant); RACT (Reactant or reagent)
(coupling component; prepn. of second-order ***nonlinear*** optical azo dyes)
IT 336-19-6, 1,2-Dichloroperfluorocyclohexene 377-93-5,
1,2-Dichloroperfluorocyclobutene 706-79-6, 1,2-Dichloroperfluorocyclopentene 1193-02-8, 4-Aminothiophenol
RL: RCT (Reactant); RACT (Reactant or reagent)
(diazo component starting material; prepn. of second-order ***nonlinear*** optical azo dyes)
IT 243461-36-1P, 1,2-Bis(4-aminophenylthio)perfluorocyclobutene
243461-38-3P, 1,2-Bis(4-aminophenylthio) ***perfluorocyclopentene***
243461-39-4P, 1,2-Bis(4-aminophenylthio)perfluorocyclohexene
243461-40-7P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(diazo component; prepn. of second-order ***nonlinear*** optical azo dyes)
IT 178401-04-2P 178401-05-3P 178401-06-4P 243461-41-8P
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(dye; prepn. of second-order ***nonlinear*** optical azo dyes)
IT 19433-93-3, 5-(Acetylamino)-N,N-diethyl-2-methoxyaniline
RL: RCT (Reactant); RACT (Reactant or reagent)

(model compd. coupling component; prepn. of second-order
nonlinear optical azo dyes)

IT 81924-79-0P, 5-Acetamido-N,N-diethyl-2-methoxy-4-(4-nitrophenylazo)aniline
243461-29-2P, 5-Acetamido-N,N-diethyl-2-methoxy-4-(phenylazo)aniline
243461-30-5P, 5-Acetamido-4-(4-chlorophenylazo)-N,N-diethyl-2-
methoxyaniline 243461-31-6P, 5-Acetamido-N,N-diethyl-4-(4-
fluorophenylazo)-2-methoxyaniline 243461-33-8P, 5-Acetamido-N,N-diethyl-
2-methoxy-4-[4-(trifluoromethyl)phenylazo]aniline 243461-34-9P
243461-35-0P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(model compd.; prepn. of second-order ***nonlinear*** optical azo
dyes)

IT 4485-08-9, 4-Nitronitrosobenzene

RL: RCT (Reactant); RACT (Reactant or reagent)
(prepn. of second-order ***nonlinear*** optical azo dyes)

IT 9011-14-7, PMMA

RL: NUU (Other use, unclassified); USES (Uses)
(second-order optical nonlinearity of azo dyes in)

RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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- (12) Nakayama, H; Appl Phys Lett 1996, V69, P2813 CAPLUS
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L2 ANSWER 13 OF 14 CAPLUS COPYRIGHT 2005 ACS on STN

AN 1999:54878 CAPLUS

DN 130:182943

ED Entered STN: 27 Jan 1999

TI Reversible photoinduced modifications of polymers doped with photochromes
: anisotropy, photo-assisted poling and surface gratings

AU Atassi, Yomen; Chauvin, Jerome; Delaire, Jacques; Delouis, Jean-Francois;
Fanton-Maltey, Isabelle; Nakatani, Keitaro

CS PPSM, URA 1906 of CNRS, Ecole Normale Supdrieure de Cachan, Cachan, 94235,
Fr.

SO Molecular Crystals and Liquid Crystals Science and Technology, Section A:
Molecular Crystals and Liquid Crystals (1998), 315, 313-324
CODEN: MCLCE9; ISSN: 1058-725X

PB Gordon & Breach Science Publishers

DT Journal; General Review

LA English

CC 36-0 (Physical Properties of Synthetic High Polymers)

Section cross-reference(s): 73, 76

AB In this paper, different optical methods which lead to orientation or
translation of several photochromes in polymer matrixes are reviewed with
17 refs. These methods lead to dichroic or birefringent, or
nonlinear optically active materials or to stable surface
gratings. They have mainly been demonstrated for azobenzene-type
photochromes, but some of these effects also occur for other kinds of
photochromes like spiropyrans, fulgides or ***diarylethenes***.

ST reversible photoinduced modification photochrome doped polymer review;
anisotropy photochrome doped polymer reversible modification review;
poling photochrome doped polymer reversible modification review; surface
grating photochrome doped polymer reversible modification review

IT Molecular orientation

Optical anisotropy

Second-harmonic generation

(anisotropy, photo-assisted poling and surface gratings of reversible
photoinduced modified PMMA doped with photochromes)

IT Polymers, properties

RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(anisotropy, photo-assisted poling and surface gratings of reversible photoinduced modified PMMA doped with photochromes)

IT Chromophores
(photo-; anisotropy, photo-assisted poling and surface gratings of reversible photoinduced modified PMMA doped with photochromes)

IT Optical switching
(photoinduced; anisotropy, photo-assisted poling and surface gratings of reversible photoinduced modified PMMA doped with photochromes)

IT Isomerization
(photoisomerization; anisotropy, photo-assisted poling and surface gratings of reversible photoinduced modified PMMA doped with photochromes)

IT Diffraction gratings
(surface; anisotropy, photo-assisted poling and surface gratings of reversible photoinduced modified PMMA doped with photochromes)

IT 9011-14-7, PMMA
RL: PRP (Properties)
(anisotropy, photo-assisted poling and surface gratings of reversible photoinduced modified PMMA doped with photochromes)

RE.CNT 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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- (9) Irie, M; Pure & Appl Chem 1996, V68, P1367 CAPLUS
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- (14) Nunzi, J; Chem Phys Lett 1994, V219, P349 CAPLUS
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L2 ANSWER 14 OF 14 CAPLUS COPYRIGHT 2005 ACS on STN

AN 1995:762770 CAPLUS

DN 123:339588

ED Entered STN: 29 Aug 1995

TI Light-triggered molecular devices: photochemical switching of optical and electrochemical properties in molecular wire type ***diarylethene*** species

AU Gilat, Sylvain L.; Kawai, Stephen H.; Lehn, Jean-Marie

CS Chim. Interactions Mol., Coll. France, Paris, 75005, Fr.

SO Chemistry--A European Journal (1995), 1(5), 275-84 Published in:

Angew. Chem., Int. Ed. Engl., 34(15)

CODEN: CEUJED; ISSN: 0947-6539

PB VCH

DT Journal

LA English

CC 27-8 (Heterocyclic Compounds (One Hetero Atom))

GI

/ Structure 1 in file .gra /

AB Bispyridine I ($R = 4$ -pyridyl) and the corresponding bispyridinium were synthesized as the uncyclized isomers from 3,5-dibromo-2-methylthiophene in overall yields of 43 and 44%, resp. The ***diarylethene*** photochromes I [$R = 1,3$ -benzodithiol-2-yl, CHO, CH:C(CN)2, etc.], substituted with electron donors and acceptors, were prep'd. from 5-methylthiophene-2-carboxyaldehyde in 21-32% overall yield. All of the compds. were found to exhibit pronounced photochromic properties. Irradn. with UV light resulted in essentially complete photocyclization of the

open forms to the intensely colored closed isomers which could, in turn, be reconverted back to the open state with visible light of λ . > 600 nm. The absorption maxima of the described compds. in their closed forms are shifted far towards, and even into, the near-IR region. Whereas no thermochromic properties were obsd. for the open isomers, the rates of thermal decoloration of the cyclized forms was found to be highly dependent on the nature of the substituents on the thiophene rings. It was demonstrated that reversible photochem. interconversion between the two photochromic states could be used to effectively switch a no. of phys. properties. Thus, the bispyridinium formed from I ($R = 4$ -pyridyl) and I ($R = 1,3$ -benzodithiol-2-yl) represent two kinds of redox switches, the former in redn. and the latter in oxidn., in which electron conduction is switched on in the closed state and off in the open state. I ($R = 1,3$ -benzodithiol-2-yl) may also be considered to be a photoswitchable analog of tetrathiafulvalene type substances. On the other hand, I ($R = 2$ -benzodithioly1) displays a marked increase in ***nonlinear*** optical activity on conversion from the open to the closed form. Such systems are prototypes of photoswitchable mol. wires where electron conduction and push-pull interaction can be reversibly modulated by an external stimulus, namely, irradn. by light.

ST redox switch ***diarylethene*** deriv; photochem switching optical electrochem property; elec cond photochem switching; ***nonlinear*** optical activity photochem switching; thermochromism ***diarylethene*** deriv; photochromism ***diarylethene*** deriv; thiénylperfluorocyclopentene photochem switching; ***perfluorocyclopentene*** dithienyl photochem switching; mol wire photoswitchable prototype

IT Thermochromism

(of closed isomers of bis(thienyl)ethene compds.)

IT Electric conductivity and conduction
Optical ***nonlinear*** property

Photochromism

(photochem. switching of optical and electrochem. properties in mol. wire type bis(thienyl)ethene species)

IT 154566-71-9P 154566-73-1P 154566-75-3P 154566-76-4P 154566-77-5P
154566-78-6P 154566-79-7P 154566-80-0P 154566-81-1P 154566-82-2P
154566-83-3P 154566-84-4P 170698-91-6P 170698-92-7P

RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(photochem. switching of optical and electrochem. properties in mol. wire type bis(thienyl)ethene species)

IT 109-77-3, Malononitrile 559-40-0, ***Perfluorocyclopentene***
13679-70-4 29421-73-6 62217-34-9 74129-11-6, 4-Bromopyridine hydrobromide

RL: RCT (Reactant); RACT (Reactant or reagent)

(photochem. switching of optical and electrochem. properties in mol. wire type bis(thienyl)ethene species)

IT 29421-75-8P 154566-69-5P 154566-70-8P 154566-74-2P 154586-93-3P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(photochem. switching of optical and electrochem. properties in mol. wire type bis(thienyl)ethene species)

=> s 11 and (((charge or hole) (2w) (transport or generat?)) or polyvinylcarbazole or carbazole or v

484684 CHARGE

62432 CHARGES

519427 CHARGE

(CHARGE OR CHARGES)

188697 HOLE

110661 HOLES

253252 HOLE

(HOLE OR HOLES)

671926 TRANSPORT

5403 TRANSPORTS

674068 TRANSPORT

(TRANSPORT OR TRANSPORTS)

925147 GENERAT?

27522 (CHARGE OR HOLE) (2W) (TRANSPORT OR GENERAT?)

2223 POLYVINYLCARBAZOLE

34 POLYVINYLCARBAZOLES

2250 POLYVINYLCARBAZOLE

(POLYVINYLCARBAZOLE OR POLYVINYLCARBAZOLES)

15956 CARBAZOLE

2128 CARBAZOLES

16513 CARBAZOLE

(CARBAZOLE OR CARBAZOLES)

5767 VINYLCARBAZOLE

122 VINYLCARBAZOLES

5783 VINYLCARBAZOLE

(VINYLCARBAZOLE OR VINYLCARBAZOLES)

1159 PVK

5 PVKS

1161 PVK

(PVK OR PVKS)

129 PVCZ

L3 8 L1 AND (((CHARGE OR HOLE) (2W) (TRANSPORT OR GENERAT?)) OR POLYVINYLCARBAZOLE OR CARBAZOLE OR VINYLCARBAZOLE OR PVK OR PVCZ)

=> d all 1-18

L3 ANSWER 1 OF 8 CAPLUS COPYRIGHT 2005 ACS on STN

AN 2003:983002 CAPLUS

DN 140:154990

ED Entered STN: 17 Dec 2003

TI Electrical carrier-injection and transport characteristics of photochromic ***diarylethene*** films

AU Tsujioka, Tsuyoshi; Masuda, Kazuya

CS Department of Arts and Sciences, Osaka Kyoiku University, Kashiwara, Osaka, 582-8582, Japan

SO Applied Physics Letters (2003), 83(24), 4978-4980
CODEN: APPLAB; ISSN: 0003-6951

PB American Institute of Physics

DT Journal

LA English

CC 76-1 (Electric Phenomena)

Section cross-reference(s): 73

AB Elec. carrier-injection and transport characteristics of photochromic ***diarylethene*** thin films were studied. Injected and transported carriers (injected current) to the ***diarylethene*** film were increased with the existence ratio of the closed-ring form, which was one isomerization state of the ***diarylethene*** mol. A dramatic increase was obsd. at a 12-percent existence ratio of the closed-ring mols. A lowering effect of the potential barrier, which is caused by a Poole-Frenkel-like effect with a short distance interaction potential for hole transportation by increasing the existence ratio of the closed-ring mols. is proposed as the mechanism behind this phenomenon.

ST ***hole*** ***transport*** photochromic arylethene film current injection

IT Conduction electrons

Electric current

Electric current-potential relationship

Electrooptical absorption

Hole mobility

Hole ***transport***

Hole traps

Isomers

Poole-Frenkel effect

Potential barrier

(elec. carrier-injection and transport characteristics of photochromic ***diarylethene*** films)

IT Isomerization

(photoisomerization, UV; elec. carrier-injection and transport characteristics of photochromic ***diarylethene*** films)

IT 406727-10-4

RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)

(elec. carrier-injection and transport characteristics of photochromic ***diarylethene*** films)

IT 123847-85-8, NPB

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)

(.alpha.-NPB; elec. carrier-injection and transport characteristics of

photochromic ***diarylethene*** films)
RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD

- RE
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(2) Homma, H; Denshi Shashin Gakkaishi (in Japanese) 1997, V36, P5
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(6) Tsujioka, T; Appl Phys Lett 2001, V78, P2282 CAPLUS
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(8) Tsujioka, T; J Opt Soc Am 1998, V15, P1140 CAPLUS
(9) Tsujioka, T; J Opt Soc Am B 2002, V19, P297 CAPLUS

L3 ANSWER 2 OF 8 CAPLUS COPYRIGHT 2005 ACS on STN

AN 2003:594726 CAPLUS

DN 139:283250

ED Entered STN: 04 Aug 2003

TI Organic bistable molecular memory using photochromic ***diarylethene***

AU Tsujioka, Tsuyoshi; Kondo, Hayato

CS Faculty of Education, Department of Arts and Sciences, Osaka Kyoiku University, Asahigaoka 4-698-1, Kashiwara, Osaka, 582-8582, Japan

SO Applied Physics Letters (2003), 83(5), 937-939

CODEN: APPLAB; ISSN: 0003-6951

PB American Institute of Physics

DT Journal

LA English

CC 74-12 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 76

AB A principle of org. memory device using a bistable photochromic mol. is presented that allows extremely high bit densities and very low power consumption. This device is based on an isomerization reaction of photochromic ***diarylethene*** mol. via its excited state by an elec. carrier injection, not by photon absorption. Exptl. data show that the reversible writing and nondestructive reading of information by the carrier injection is feasible. The advantages and properties of such an org. semiconductor memory using a bistable mol. are discussed.

ST org bistable mol memory photochromic ***diarylethene*** reversible isomerization; elec excitation photochromic ***diarylethene*** org bistable mol memory

IT Memory devices

(nonvolatile; org. memory device using bistable photochromic ***diarylethene*** and based on isomerization of ***diarylethene*** via its excited state induced by elec. carrier injection)

IT Cyclization

Photochromic materials

Ring opening

(org. memory device using bistable photochromic ***diarylethene*** and based on isomerization of ***diarylethene*** via its excited state induced by elec. carrier injection)

IT 50926-11-9, ITO

RL: DEV (Device component use); USES (Uses)
(anode; org. memory device using bistable photochromic ***diarylethene*** and based on isomerization of ***diarylethene*** via its excited state induced by elec. carrier injection)

IT 221042-24-6

RL: DEV (Device component use); USES (Uses)
(cathode; org. memory device using bistable photochromic ***diarylethene*** and based on isomerization of ***diarylethene*** via its excited state induced by elec. carrier injection)

IT 185690-39-5, 4,4',4''-Tris[N-(1-naphthyl)-N-phenylamino]-triphenylamine

RL: DEV (Device component use); USES (Uses)
(hole injection layer; org. memory device using bistable photochromic ***diarylethene*** and based on isomerization of ***diarylethene*** via its excited state induced by elec. carrier injection)

IT 123847-85-8

RL: DEV (Device component use); USES (Uses)
(***hole*** ***transport*** ; org. memory device using bistable photochromic ***diarylethene*** and based on isomerization of ***diarylethene*** via its excited state induced by elec. carrier injection)

IT 606127-31-5

RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(open form; org. memory device using bistable photochromic
diarylethene and based on isomerization of ***diarylethene***
via its excited state induced by elec. carrier injection)

IT 606127-30-4

RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(org. memory device using bistable photochromic ***diarylethene***
and based on isomerization of ***diarylethene*** via its excited state induced by elec. carrier injection)

RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Aviram, A; Chem Phys Lett 1974, V29, P277 CAPLUS
- (2) Chen, J; Science 1999, V286, P1550 CAPLUS
- (3) Chung, S; Appl Phys Lett 2000, V76, P2068 CAPLUS
- (4) Donhauser, Z; Science 2001, V292, P2303 CAPLUS
- (5) Huang, Y; Science 2001, V291, P630 CAPLUS
- (6) Irie, M; Chem Rev (Washington, D C) 2001, V100, P1685
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- (13) Tsujioka, T; Appl Phys Lett 2001, V78, P2282 CAPLUS

L3 ANSWER 3 OF 8 CAPLUS COPYRIGHT 2005 ACS on STN

AN 2002:6078 CAPLUS

DN 136:286972

ED Entered STN: 03 Jan 2002

TI Carrier injection/transport characteristics of photochromic
diarylethene film

AU Taniguchi, Akira; Tsujioka, Tsuyoshi; Hamada, Yuji; Shibata, Kenichi;
Fuyuki, Takashi

CS Graduate School of Materials Science, Nara Institute of Science and
Technology, Ikoma, Nara, 630-0101, Japan

SO Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes &
Review Papers (2001), 40(12), 7029-7030

CODEN: JAPNDE

PB Japan Society of Applied Physics

DT Journal

LA English

CC 76-1 (Electric Phenomena)

Section cross-reference(s): 73

AB Photochromic ***diarylethenes*** with elec. carrier (hole) controlling
ability for nondestructive readout were investigated. The ionization
potential of the photostationary colored ***diarylethene*** films was
around 5.7-5.8 eV irresp. of differences in their mol. structures. Good
hole injection/ ***transport*** characteristics were obsd. for
the colored films of ***diarylethenes*** with triphenylamine groups.

ST carrier transport ***diarylethene***

IT Photochromic materials

(carrier injection/transport characteristics of photochromic
diarylethene film)

IT Electric current carriers

Hole (electron)

(injection; carrier injection/transport characteristics of photochromic
diarylethene film)

IT Electric current carriers

(transport; carrier injection/transport characteristics of photochromic
diarylethene film)

IT 252253-50-2 314075-73-5 406727-09-1 406727-10-4 406727-11-5

RL: PRP (Properties)

(carrier injection/transport characteristics of photochromic
diarylethene film)

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Adachi, C; Appl Phys Lett 1995, V66, P2679 CAPLUS

(2) Anon; Photo-Reactive Materials for Ultrahigh Density Optical Memory 1994

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 (8) Tsujioka, T; Appl Opt 1999, V38, P5066
 (9) Tsujioka, T; Appl Phys Lett 2001, V78, P2282 CAPLUS

L3 ANSWER 4 OF 8 CAPLUS COPYRIGHT 2005 ACS on STN
 AN 2001:932566 CAPLUS
 DN 136:54934
 ED Entered STN: 27 Dec 2001
 TI Radiation-sensitive compositions containing photochromic compounds and thermally stable dosimeters manufactured from them
 IN Irie, Masahiro; Irie, Setsuko; Tanaka, Yuki
 PA Mitsubishi Chemical Corp., Japan
 SO Jpn. Kokai Tokkyo Koho, 8 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM C08L101-00
 ICS C08F012-02; C08F024-00; C08F026-06; C08F026-12; C08F028-06;
 C08F212-06; C08F212-08; C08K005-01; C08L025-00; C08L025-04;
 C08L025-16; C08L037-00; C08L039-04; C08L041-00; C09K009-02;
 G01T001-04
 CC 38-3 (Plastics Fabrication and Uses)
 Section cross-reference(s): 25, 71

FAN.CNT 1

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------------|------|----------|-----------------|----------|
| PI JP 2001354862 | A2 | 20011225 | JP 2000-178581 | 20000614 |
| PRAI JP 2000-178581 | | 20000614 | | |

CLASS

| PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|---------------|-------|---|
| JP 2001354862 | ICM | C08L101-00 |
| | ICS | C08F012-02; C08F024-00; C08F026-06; C08F026-12;
C08F028-06; C08F212-06; C08F212-08; C08K005-01;
C08L025-00; C08L025-04; C08L025-16; C08L037-00;
C08L039-04; C08L041-00; C09K009-02; G01T001-04 |

AB The compns. contain thermally irreversible photochromic compds. and compds. having condensed polycyclic arom. structures. Thus, a transparent film manufd. from 0.90 g styrene-2-vinylnaphthalene copolymer and 0.10 g 1,2-bis(2-methyl-5-phenyl-3-thienyl) ***perfluorocyclopentene*** turned blue (600 nm absorption increase 0.070) after .gamma.-ray irradn. and no absorption change after 1 day at a room temp.

ST radiation sensitivity thermally irreversible photochromic compd; dosimeter ***diarylethene*** polycyclic arom compd naphthalene; vinylnaphthalene copolymer arylethene film thermal stability

IT Polycyclic compounds

RL: TEM (Technical or engineered material use); USES (Uses)
 (arom.; radiation-sensitive compns. contg. photochromic compns. and vinylnaphthalene copolymers or condensed polycyclic arom. compds. for dosimeters)

IT Aromatic compounds

RL: TEM (Technical or engineered material use); USES (Uses)
 (polycyclic; radiation-sensitive compns. contg. photochromic compns. and vinylnaphthalene copolymers or condensed polycyclic arom. compds. for dosimeters)

IT Dosimeters

(radiation-sensitive compns. contg. photochromic compns. and vinylnaphthalene copolymers or condensed polycyclic arom. compds. for dosimeters)

IT Photochromic materials

(thermally irreversible; radiation-sensitive compns. contg. photochromic compns. and vinylnaphthalene copolymers or condensed polycyclic arom. compds. for dosimeters)

IT 182003-69-6

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
 (radiation-sensitive compns. contg. photochromic compns. and vinylnaphthalene copolymers or condensed polycyclic arom. compds. for dosimeters)

IT 85-01-8, Phenanthrene, uses 86-73-7, Fluorene 86-74-8,

Carbazole 91-20-3, Naphthalene, uses 91-22-5, Quinoline, uses
95-15-8, Benzothiophene 119-65-3, Isoquinoline 120-12-7, Anthracene,
uses 120-72-9, Indole, uses 129-00-0, Pyrene, uses 198-55-0,
Perylene 208-96-8, Acenaphthylene 217-59-4, Triphenylene 218-01-9,
Chrysene 229-87-8, Phenanthridine 271-89-6, Benzofuran 275-51-4,
Azulene 60279-76-7, Styrene-2-vinylnaphthalene copolymer
RL: TEM (Technical or engineered material use); USES (Uses)
(radiation-sensitive compns. contg. photochromic compns. and
vinylnaphthalene copolymers or condensed polycyclic arom. compds. for
dosimeters)

L3 ANSWER 5 OF 8 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2000:764173 CAPLUS
DN 134:63722
ED Entered STN: 01 Nov 2000
TI Radiation sensitivity of photochromic ***diarylethenes***
AU Irie, S.; Irie, M.
CS Research Institute for Advanced Science and Technology, Osaka Prefecture
University, Osaka, 599-8570, Japan
SO Molecular Crystals and Liquid Crystals Science and Technology, Section A:
Molecular Crystals and Liquid Crystals (2000), 345, 179-184
CODEN: MCLCE9; ISSN: 1058-725X
PB Gordon & Breach Science Publishers
DT Journal
LA English
CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other
Reprographic Processes)
Section cross-reference(s): 71
AB The radiation sensitivity of photochromic dithienylethenes was studied
with the aim of developing a new reusable color film dosimeter. Upon
.gamma.-irradn., polystyrene films contg. 1,2-bis(2,5-dimethyl-3-thienyl)
perfluorocyclopentene (1) and 1,2-bis(2-methyl-5-phenyl-3-thienyl)
perfluorocyclopentene (2) turned red and blue, resp. The red and
blue colors disappeared by visible-light irradn. and the films could be
reused. In both films the absorption intensities of the colors linearly
increased with the absorbed dose. From the color change it was possible
to est. the radiation dose.
ST radiation sensitivity photochromic ***diarylethene*** color dosimeter;
gamma radiation color dosimeter photochromic ***diarylethene***
IT Dosimeters
(gamma-ray, film; radiation sensitivity of photochromic
dithienylethenes for development of reusable color dosimeter film)
IT Polycarbonates, properties
Polyolefins
RL: PEP (Physical, engineering or chemical process); PRP (Properties);
PROC (Process)
(matrix; radiation sensitivity of photochromic dithienylethenes for
development of reusable color dosimeter film)
IT 9003-53-6, Polystyrene 9011-14-7, PMMA 25067-59-8, Poly(N-
vinylcarbazole)
RL: PEP (Physical, engineering or chemical process); PRP (Properties);
PROC (Process)
(matrix; radiation sensitivity of photochromic dithienylethenes for
development of reusable color dosimeter film)
IT 182003-69-6 190394-25-3, 1,2-Bis(2,5-dimethyl-3-thienyl)
perfluorocyclopentene 222972-69-2 277303-68-1
RL: PEP (Physical, engineering or chemical process); PRP (Properties);
PROC (Process)
(radiation sensitivity of photochromic dithienylethenes for development
of reusable color dosimeter film)
RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Fujimura, R; Housyasen ni yoru Kotaigensyo to Senryosokutei 1985
(2) Irie, M; Bull Chem Soc Jpn 1998, V71, P985 CAPLUS
(3) Irie, M; Chem Lett 1995, P899 CAPLUS
(4) Irie, S; Bull Chem Soc Jpn 1999, V72, P1139 CAPLUS
(5) Kawanishi, S; Oyobutsuri 1982, V51, P293
(6) Yamagami, M; J Photopol Sci Tech 1995, V8, P101

L3 ANSWER 6 OF 8 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2000:751164 CAPLUS
DN 134:63711

ED Entered STN: 25 Oct 2000
TI Radiation-Induced Coloration of Photochromic Dithienylethene Derivatives
 in Polymer Matrixes
AU Irie, Setsuko; Irie, Masahiro
CS Res. Inst. Adv. Sci. Technol., Osaka Prefecture University, Sakai, Osaka,
 599-8570, Japan
SO Bulletin of the Chemical Society of Japan (2000), 73(10), 2385-2388
 CODEN: BCSJA8; ISSN: 0009-2673
PB Chemical Society of Japan
DT Journal
LA English
CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other
 Reprographic Processes)
 Section cross-reference(s): 71
AB The high-energy radiation-induced coloration of photochromic
 dithienylethenes was studied in various polymer matrixes with the aim of
 developing a reusable color plastic dosimeter. Upon .gamma.-irradn.,
 polystyrene films contg. 1,2-bis(2,5-dimethyl-3-thienyl)
 perfluorocyclopentene 1a and 1,2-bis(2-methyl-5-phenyl-3-thienyl)
 perfluorocyclopentene 2a turned red and blue, resp. The red and
 blue colors disappeared upon irradn. with visible light, and the films
 could be reused. In both films the absorption intensities of the colors
 increased linearly with the absorbed dose. Although radiation-induced
 coloration was clearly detected in polystyrene films, a color change was
 scarcely obsd. in poly(Me methacrylate) (PMMA) and poly(N-vinyl
 carbazole) contg. 1a and 2a. Excitation energy transfer from
 polymers to dithienylethenes is considered to play a role in the
 coloration process in polymer films.
ST gamma ray coloration photochromic dithienylethene polymer matrix film
 dosimeter
IT Dosimeters
 (gamma-ray; radiation-induced coloration of photochromic
 dithienylethenes in relation to design of reusable color plastic
 dosimeters)
IT Polycarbonates, properties
RL: PEP (Physical, engineering or chemical process); PRP (Properties);
PROC (Process)
 (matrix; radiation-induced coloration of photochromic dithienylethenes
 in relation to design of reusable color plastic dosimeters)
IT Energy transfer
Optical absorption
Photochromic materials
Singlet state excitation
 (radiation-induced coloration of photochromic dithienylethenes in
 relation to design of reusable color plastic dosimeters)
IT 9003-53-6, Polystyrene 9011-14-7, PMMA 25067-59-8, Poly(N-
 vinylcarbazole)
RL: PEP (Physical, engineering or chemical process); PRP (Properties);
PROC (Process)
 (matrix; radiation-induced coloration of photochromic dithienylethenes
 in relation to design of reusable color plastic dosimeters)
IT 277303-68-1 313947-80-7
RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical
process); PRP (Properties); FORM (Formation, nonpreparative); PROC
(Process)
 (radiation-induced coloration of photochromic dithienylethenes in
 relation to design of reusable color plastic dosimeters)
IT 182003-69-6 190394-25-3, 1,2-Bis(2,5-dimethyl-3-thienyl)
 perfluorocyclopentene
RL: PEP (Physical, engineering or chemical process); PRP (Properties);
PROC (Process)
 (radiation-induced coloration of photochromic dithienylethenes in
 relation to design of reusable color plastic dosimeters)
RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Birks, J; Photophysics of Aromatic Molecules 1970
(2) Fujimura, R; Housyasen niyoru Kotaigensyou to Senryousokutei 1985
(3) Irie, M; Bull Chem Soc Jpn 1998, V71, P985 CAPLUS
(4) Irie, M; Chem Lett 1995, P899 CAPLUS
(5) Irie, M; J Org Chem 1995, V60, P8305 CAPLUS
(6) Irie, S; Bull Chem Soc Jpn 1999, V72, P1139 CAPLUS
(7) Johnson, G; J Chem Phys 1975, V62, P4697 CAPLUS

- (8) Kawanishi, S; Oyobuturi 1982, V51, P293
 (9) Hopffer, W; J Polym Sci, Symp 1973, V40, P43
 (10) Miyasaka, H; Chem Phys Lett 1997, V269, P281 CAPLUS
 (11) Whitaker, B; Manual on Radiation Dosimetry 1970, P363
 (12) Yamagami, M; J Photopol Sci Tech 1995, V8, P101

L3 ANSWER 7 OF 8 CAPLUS COPYRIGHT 2005 ACS on STN
 AN 1998:785488 CAPLUS
 DN 130:160578
 ED Entered STN: 15 Dec 1998
 TI Characterization of dye-doped PMMA/ ***PVK*** films as recording materials
 AU Lafond, Christophe; Lessard, Roger A.; Bolte, Michele; Petkov, Ivan
 CS Centre d'Optique Photonique et Laser (COPL), Universite Laval, Quebec,
 G1K7P4, Can.
 SO Proceedings of SPIE-The International Society for Optical Engineering
 (1998), 3417(Photopolymer Device Physics, Chemistry and Applications IV),
 216-227
 CODEN: PSISDG; ISSN: 0277-786X
 PB SPIE-The International Society for Optical Engineering
 DT Journal
 LA English
 CC 74-12 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
 AB The photoinduced reversible color change in photochromic mol. doped PMMA and poly(***vinylcarbazole***) (***PVK***) films was investigated. Upon UV and visible irradn., changes of an optical absorption of a closed form of a photochromic mol., in the beginning of the photoreaction, followed first-order kinetic and, then deviated from this order. The rate-consts. kUV of the coloring process, and kVIS of the bleaching process, were detd. For the two ***diarylethenes*** studied, kUV, was much larger in both polymer matrixes. However, kVIS was stronger in ***PVK*** for fulgide Aberchrome 670. Both rates were identical in PMMA. Photochem. fatigue resistance was studied. For fulgide Aberchrome 670 in PMMA matrix, the authors found 13% disappearance after 10 repeated UV and visible cycles.
 ST optical recording photochromic compd doped polymer film; photolysis photochromism fulgide doped polymer; ***diarylethene*** photochromism fulgide doped polymer
 IT UV and visible spectra
 (absorption; photoinduced reversible color changes in PMMA and poly(***vinylcarbazole***) films contg. fulgide or ***diarylethene*** photochromic mols.)
 IT Absorption spectra
 Optical recording
 Photochromic materials
 Photochromism
 Photolysis
 Photolysis kinetics
 (photoinduced reversible color changes in PMMA and poly(***vinylcarbazole***) films contg. fulgide or ***diarylethene*** photochromic mols.)
 IT Isomerization
 (photoisomerization; photoinduced reversible color changes in PMMA and poly(***vinylcarbazole***) films contg. fulgide or ***diarylethene*** photochromic mols.)
 IT 9011-14-7, PMMA 25067-59-8, Poly(***vinylcarbazole***) 94856-25-4
 112440-47-8 112440-48-9 142381-71-3 220191-33-3 220191-36-6
 220191-38-8
 RL: PEP (Physical, engineering or chemical process); PRP (Properties);
 PROC (Process)
 (photoinduced reversible color changes in PMMA and poly(***vinylcarbazole***) films contg. fulgide or ***diarylethene*** photochromic mols.)
 RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
 RE
 (1) Durr, H; Photochromism:Molecules and Systems 1990, P5
 (2) Ghailane, F; Ph D thesis Universite Laval 1995
 (3) Hanazawa, M; J Chem Soc Chem Commun 1992, V3, P206
 (4) Hoshino, M; J Photochem Photobiol A: Chem 1997, V105(1), P75 CAPLUS
 (5) Irie, M; J Org Chem 1988, V53, P803 CAPLUS
 (6) Kaneko, A; Bull Chem Soc Jpn 1988, V61(10), P3569 CAPLUS

- (7) Tsuyioka, T; J Photochem Photobiol A: Chem 1997, V104, P203
 (8) Whitall, J; Photochromism: Molecules and Systems 1990, P467
 (9) Yokoyama, Y; Bull Chem Soc Jpn 1990, V63(6), P1607 CAPLUS
 (10) Yokoyama, Y; J Chem Soc Chem Commun 1991, V24, P1722

L3 ANSWER 8 OF 8 CAPLUS COPYRIGHT 2005 ACS on STN
 AN 1997:457764 CAPLUS
 DN 127:115179
 ED Entered STN: 23 Jul 1997
 TI Charge injection photocontrol at the metal/organic interface by a photochromic compound
 AU Honma, Hisakazu; Yokoyama, Masaaki
 CS Material and Life Science, Grad. School Engineering, Osaka Univ., Suita, 565, Japan
 SO Denshi Shashin Gakkaishi (1997), 36(1), 5-10
 CODEN: DSHGDD; ISSN: 0387-916X
 PB Denshi Shashin Gakkai
 DT Journal
 LA Japanese
 CC 74-12 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
 AB ***Diarylethenes*** are known as thermally stable photochromic compds., particularly of which ***diarylethene*** derivs. having bithiophene as the side groups undergo the great change in the pi.-electron conjugation length between the open-form and closed-form upon their photo-isomerization. Consequently, the ionization potential (Ip) is expected to change between both forms. In this paper, we have applied the difference of Ip between these two forms for controlling the hole injection from a metal electrode to an org. film. We have succeeded in demonstrating the photo-switch of the injection current on the order of sub-miliampere upon photo-isomerization by inserting a thin film of ***diarylethene*** deriv. in-between metal and org. ***charge*** ***transport*** layer.
 ST photochromic ***diarylethene*** charge injection photocontrol photoswitch
 IT Electrophotographic photoconductors (photoreceptors)
 Optical recording materials
 Optical switching
 Photochromic materials
 Spatial light modulators
 (charge injection photocontrol at the metal/org. interface by a photochromic compd.)
 IT Isomerization
 (photoisomerization; charge injection photocontrol at the metal/org. interface by a photochromic compd.)
 IT 159590-09-7P
 RL: DEV (Device component use); PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation); USES (Uses)
 (charge injection photocontrol at the metal/org. interface by a photochromic compd.)

=> d his

(FILE 'HOME' ENTERED AT 10:05:32 ON 14 NOV 2005)

FILE 'CAPLUS' ENTERED AT 10:05:38 ON 14 NOV 2005
 L1 828 S (DIARYLETHENE OR PERFLUOROCYCLOPENTENE)
 L2 14 S L1 AND (NLO OR NONLINEAR OR HYPERPOLARIZ? OR NON(2A)LINEAR)
 L3 8 S L1 AND (((CHARGE OR HOLE) (2W) (TRANSPORT OR GENERAT?)) OR POLY

=> log y

| COST IN U.S. DOLLARS | SINCE FILE ENTRY | TOTAL SESSION |
|--|------------------|---------------|
| FULL ESTIMATED COST | 97.83 | 98.04 |
| DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS) | SINCE FILE ENTRY | TOTAL SESSION |
| CA SUBSCRIBER PRICE | -16.06 | -16.06 |

STN INTERNATIONAL LOGOFF AT 10:08:52 ON 14 NOV 2005

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|-------|--------|---|---|------------------|---------|------------------|
| L1 | 45473 | (photochromic or spiropyran\$1 or fulgide\$4 or stilbene\$1 or leuco or diarylethane\$\$ or diheteroarylethane\$2 or dithiophene\$7) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/11/14 08:21 |
| L2 | 171897 | (photorefract\$6 or polyvinylcarbazole\$1 or carbazole\$1 or vinylcarbazole\$1 or ((charge or hole) near5 (transport or generat\$6))) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/11/14 08:21 |
| L3 | 2272 | I1 same I2 | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/11/14 08:21 |
| L4 | 171934 | (photorefract\$6 or pvcz or polyvinylcarbazole\$1 or carbazole\$1 or vinylcarbazole\$1 or ((charge or hole) near5 (transport or generat\$6))) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/11/14 08:32 |
| L5 | 2272 | I1 same I4 | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/11/14 08:21 |
| L6 | 7 | (diarylethane\$\$ or diheteroarylethane\$2 or dithiophene\$7) same I4 | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/11/14 08:23 |
| L7 | 7 | (diarylethane\$\$ or diheteroarylethane\$2 or dithiophene\$7) and I3 | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/11/14 08:23 |
| L8 | 99 | (diarylethane\$\$ or diheteroarylethane\$2 or dithiophene\$7) and I4 | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/11/14 08:24 |
| L9 | 75 | I8 and @ad<"20030818" | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/11/14 08:33 |
| L10 | 325283 | (ito or ((indium or tin) near5 oxide\$1)) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2005/11/14 08:31 |

| | | | | | | |
|-----|--------|--|---|----|----|------------------|
| L11 | 517387 | I10 or (I1 or I4) | US-PGPUB;
USPAT;
EPO; JPO;
DERWENT;
IBM_TDB | OR | ON | 2005/11/14 08:31 |
| L12 | 3706 | I10 same (I1 or I4) | US-PGPUB;
USPAT;
EPO; JPO;
DERWENT;
IBM_TDB | OR | ON | 2005/11/14 08:31 |
| L13 | 410 | I5 and I12 | US-PGPUB;
USPAT;
EPO; JPO;
DERWENT;
IBM_TDB | OR | ON | 2005/11/14 08:32 |
| L14 | 410 | (pvcz or polyvinylcarbazole\$1 or carbazole\$1 or vinylcarbazole\$1 or ((charge or hole) near5 (transport or generat\$6))) and I13 | US-PGPUB;
USPAT;
EPO; JPO;
DERWENT;
IBM_TDB | OR | ON | 2005/11/14 08:32 |
| L15 | 328 | I13 and @ad<"20030818" | US-PGPUB;
USPAT;
EPO; JPO;
DERWENT;
IBM_TDB | OR | ON | 2005/11/14 08:33 |
| L16 | 136 | I15 not (tonor or Toner or electrophoto\$8 or emitting).ti,ab. | US-PGPUB;
USPAT;
EPO; JPO;
DERWENT;
IBM_TDB | OR | ON | 2005/11/14 08:37 |
| L17 | 288864 | (nonlinear or hyperpolariz\$6 or (second near5 order) or nlo) | US-PGPUB;
USPAT;
EPO; JPO;
DERWENT;
IBM_TDB | OR | ON | 2005/11/14 08:38 |
| L18 | 27 | I13 and I17 | US-PGPUB;
USPAT;
EPO; JPO;
DERWENT;
IBM_TDB | OR | ON | 2005/11/14 08:38 |